AN EVALUATION OF THE PHYSICAL AND PSYCHOLOGICAL EFFECTS OF A RIDING THERAPY PROGRAMME FOR CEREBRAL PALSIED CHILDREN

ANNA-MART STUART

Thesis presented in fulfilment of the requirements for the degree of Master of Science (Psychology) at the University of Stellenbosch

Supervisor: H. Loxton

March, 1999

STATEMENT

I, the undersigned, hereby declare that the work contained in this thesis is my own original work, and that I have not previously in its entirety or in part submitted it at any university for a degree.

08/02/99
Date

SUMMARY

The aim of the present study was to establish whether disabled children show an increase in self-concept and a shift toward an internal locus of control due to their participation in a riding therapy programme. The children's physical improvement as riders were also evaluated.

Riding therapy as implemented by the South African Riding for the Disabled Association (SARDA), is a form of physical education with psychosocial benefits. SARDA's aim is to teach children and adults to ride as competently as possible. An emphasis is placed on overcoming disabilities, improving daily living, and providing recreation.

The study took the form of a quasi-experimental non-equivalent control group research design. The subjects consisted of an experimental group of twelve cerebral palsied children who commenced riding therapy in January 1997. The control group was paired off to the experimental group by the following factors: age, gender, and type of disability.

The pre-test data collection took place in January, 1997. The effect of riding therapy on the self-concept of physically disabled children was evaluated by the Piers-Harris Children's Self-concept Scale and locus of control orientation was measured by the Pre-Primary Nowicki-Strickland Locus of Control Scale. The post-test data collection took place after the experimental group had participated in riding therapy for six months, every second week (approximately 12 sessions). The parents of the experimental group subjects were asked to complete the Parents Questionnaire. This informal questionnaire was developed for the present study to determine whether the parents noticed any changes in the time that their children participated in riding therapy. The experimental group's riding progress was evaluated by the Rider Classification Scale, developed for the present study, and administered at the time of the pre- and post-test data collection. The helpers involved with riding therapy were asked to comment on the benefits or changes that they have noticed in the children over the six months period.

There were no significant statistical improvement in self-concept scores or a shift towards an internal locus of control scores found, as established by the Wilcoxen Signed Ranks test. The experimental subjects' riding skills as evaluated by the Rider Classification Scale did however improve significantly. Information derived from the parents' questionnaires and the helpers' written comments were combined to formulate two case studies. General physical improvements as observed by parents and helpers were improved balance and co-ordination, decrease in muscle stiffness, tenseness and overall anxiety. Helpers and parents commented that subjects became self-assured and confident and enjoyed the riding therapy immensely.

Although the quantitative aspect of this study did not amount to significant results, the qualitative aspect did. The qualitative results of the present study show that the professionals and other persons involved with riding therapy recognise changes and improvement in participants, both physically and psychologically. Further studies need to be conducted in order to establish the validity of riding therapy as a successful means of therapy for cerebral palsied children in South Africa.

OPSOMMING

Die doel van die huidige studie was om vas te stel of gestremde kinders 'n toename in selfkonsep en 'n verskuiwing na 'n interne lokus van kontrole as gevolg van hul deelname in perdryterapie program ondergaan. Die subjekte se fisiese verbetering as ruiters is ook geëvalueer.

Perdryterapie, soos geïmplimenteer deur die Suid-Afrikaanse Assosiasie van Perdry vir Gestremdes (SARDA), is 'n vorm van fisiese onderrig met psigo-sosiale voordele. SARDA se doel is om kinders en volwassenes tot die beste van hul vermoë te leer perdry. Die klem word geplaas op die oorbrugging van gestremdheid, verbetering van daaglikse lewenstake sowel as op ontspanning.

Die studie het die vorm aangeneem van 'n kwasi-eksperimentele nie-gelyke kontrole groep-ontwerp. Die subjekte het bestaan uit 'n eksperimentele groep van twaalf serebraal gestremde kinders wat met 'n perdryterapie program begin het in Januarie 1997. Die kontrole groep is afgepaar teenoor die eksperimentele groep op grond van die volgende faktore: ouderdom, geslag en tipe gestremdheid.

Die voortoets het in Januarie 1997 plaasgevind. Die effekte van perdryterapie op die self-konsep van die fisies gestremde kinders is geëvalueer met behulp van die Piers-Harris Children Self-Concept Skaal. Die lokus van kontrole oriëntasie is met behulp van die Pre-Primary Nowicki-Strickland Locus of Control Scale for Children gemeet. Die na-toets het plaasgevind nadat die eksperimentele groep vir ses maande elke tweede week aan 'n perdryterapie program deelgeneem het.

Die ouers van die eksperimentele subjekte is gevra om die Parents Questionnaire te voltooi. Hierdie informele vraelys is spesifiek vir die huidige studie ontwerp om vas te stel of ouers enige veranderinge opgemerk het vandat hul kinders aan die perdryterapie program deelgeneem het. Die eksperimentele groep se perdryvordering is geëvalueer met behulp van die Rider Classification Scale, wat spesifiek vir die huidige studie aangepas is. Hierdie skaal is by beide die voor en na-toets geadministreer. Die helpers, wat by die perdryterapie sessies van die eksperimentele groep betrokke was, is ook gevra om skriftelik hul menings te gee aangaande die veranderinge wat hulle oor die ses maande periode by elke subjek waargeneem het.

Statisties is geen beduidende verandering in selfkonseptellings of verskuiwing na interne lokus van kontroletellings gevind, soos gemeet deur die Wilcoxen Rangorde toets. Die eksperimentele groep se perdryvaardighede soos geëvalueer deur die Rider Classification Scale, het wel 'n beduidende statistiese verbetering getoon. Die informasie verkry deur die Parents Questionnaire sowel as die geskrewe menings van die helpers, is gekombineer om twee gevallestudies te formuleer. Algemene fisiese verbeteringe sluit in: verbetering in balans en koördinasie, afname van spierstyfheid, gespannenheid en algehele angstigheid. Helpers en ouers het waargeneem dat subjekte meer selfvertroue en selfversekerheid getoon het en dat hulle die perdryterapie program terdeë geniet het.

Alhoewel die kwantitatiewe aspek van hierdie studie nie betekenisvolle resultate getoon het nie, het die kwalitatiewe aspek wel. Die kwalitatiewe resultate van die huidige studie toon dat die professionele persone, sowel as ander persone wat betrokke is by perdryterapie, veranderinge en verbeteringe op beide fisiese en sielkundige gebied, in subjekte waargeneem het. Verdere studies behoort onderneem te word ten einde die validiteit en sukses van perdryterapie as 'n suksesvolle terapie vir gestremde kinders in Suid-Afrika te bepaal.

FOREWORD (THANKS)

I would like to express my sincerest thanks to the following persons for assisting me with this dissertation:

Mrs H. Loxton, my supervisor, for her inspiration, support and dedication;

The principal, teachers and the physiotherapy department of the participating school, who made it possible for this study to be carried out;

The instructors and helpers at SARDA's Constantia branch, who readily encouraged this investigation and participated wholeheartedly;

The scholars who participated in this research without whose co-operation this study would not have been possible;

My husband, family and friends, for your love and support.

I would like to dedicate the present study to my father, who has supported and encouraged me throughout my life and who will always be my role model and mentor.

CONTENTS

PAGE:

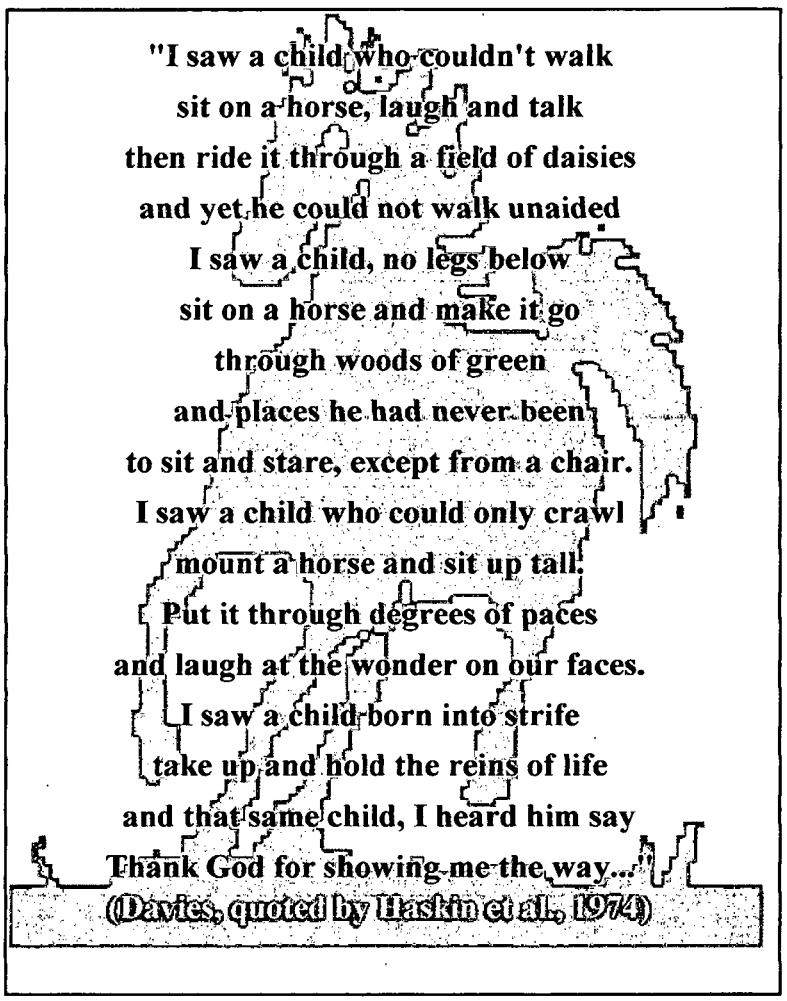
PAGE:

PAGE:

PAGE:

LIST OF FIGURES

LIST OF TABLES



CHAPTER 1

INTRODUCTION, MOTIVATION FOR AND AIMS OF THE RESEARCH

1.1 INTRODUCTION

Approximately 10% of all South Africans have a disability and encounter daily discrimination and marginalisation because of their disabilities. Disabled people are often amongst the poorest of the poor and prevailing services to disabled people are hopelessly inadequate (Government Gazette, 1996).

Developing activities that can realistically effect integration for the disabled is a challenge to lay as well as professional people concerned with the quality of life for the disabled person. Occupational therapists encourage their physically disabled patients to be less dependent upon others, to lead fuller lives and to participate in activities in which non-disabled individuals also take part. At present horse riding is becoming more established as an activity which can lead to the realisation of these aims, with the additional benefit of being therapeutic (Whalley, 1980; Wingate, 1982).

Riding therapy refers to individually prescribed, active physiotherapeutic exercise on horseback. The rider is passively influenced by the movement of the horse and actively performs exercises. Riding therapy usually complements other physical therapy treatment (DePauw, 1986). Disabled persons who participate in riding therapy range from the deaf, blind, autistic, mentally disabled, and physically disabled. The present study focuses on a specific physical disability namely cerebral palsy. Walker (1978) states that the cerebral palsied is the second biggest

group of riders participating in riding therapy world wide. The biggest group is the mentally disabled. Cerebral palsy is a disorder of movement or posture caused by injury to the brain in early life. Clinical conditions such as perceptual, cognitive, seizure, and behavioural problems are usually associated with cerebral palsy (Dallas, Stevenson, and McGurk, 1993).

Riding therapy, unlike most other forms of physical therapy that is performed in institutions and hospitals, enables disabled children to experience the joy of associating with a living animal. While mounted on a horse, the disabled person learns to use every ounce of muscle and nerve remaining. The psychological improvement is usually immediate and physical improvement follows later (Angier, 1988; Henrikson, 1971).

Wingate (1982) states that a well-planned and carefully controlled riding therapy programme can facilitate physical improvement in both minimally and extensively handicapped individuals. Riding therapy has been shown to improve posture, facilitate equilibrium reactions, balance, body image, self-concept and reduce spasticity (Adams and McCubbin, 1991; Bertoti, 1988; Mayberry, 1978; Walker, 1978; Whalley, 1980; Wood, 1990).

1.2 MOTIVATION FOR RESEARCH

South African riding therapy programmes are based on American and British models. A study investigating the psychological benefits of riding therapy will be crucial to the optimal use of riding therapy in South African conditions. Although several authors have investigated the benefits of riding therapy overseas, this has up to now never been done in South Africa. A scientific need for research concerning riding therapy and the social need of disabled persons in the community motivated this author to embark upon the tedious task of scientifically investigating the psychological benefits of riding therapy.

1.2.1 Scientific Need for Research Concerning Riding Therapy

The need for research concerning the psychological benefits of riding therapy is internationally recognised and is crucial in considering the optimal use of riding therapy. Wood (1990) states the importance of the need for scientific research with respect to both the physiological and psycho-social benefits of therapeutic riding by referring to Peacock's view stated at the 6th International Conference on Riding for the Disabled, viz:

> *"Peacock recognised that at the congress, she was preaching to the converted, but more scientific data were required to convince Governments, Health and Education authorities. We require more documented results with properly controlled studies and large numbers of fully assessed riders before we can prove validity of riding therapy to the uninitiated and indeed ourselves" (p 333).*

The South African Riding for the Disabled Association's (SARDA) constitution recognises the need for research into the beneficial effects of horse riding and the dissemination of such research findings (Wood, 1990).

1.2.2 The Social Need of the Disabled in the South African Community

According to the White Paper on Reconstruction and Development (1994), the disabled were, in the past, dependent on a welfare model that disempowered, isolated, and marginalised them from the mainstream of society. It is stated in the Integrated National Disability Strategy of the Government of National Unity (1996) that reconstruction and development of the South African society involves recognising and addressing the developmental needs of disabled people and that government is bound:

> "... to promote, in the spirit of international co-operation, the exchange of appropriate information in the field of preventive health care and of medical, psychological and functional treatment of disabled children, including dissemination of and access to information concerning methods of rehabilitation, education and vocational services, with the aim of enabling state parties to improve their capabilities and skills and to widen their experience in these areas. (p 27)."

The present study investigates the benefits of a therapeutic riding programme for disabled South African children, supporting proposals of the White Paper on Reconstruction and Development (1994). Section 3.3.10 of the Reconstruction and Development Programme Policy Framework (1994) states that existing facilities for disabled children should be optimally used and new programmes should be developed where needed.

The Reconstruction and Development Program Policy Framework (1994) also states that the disabled should be integrated into community activities. One of the greatest challenges facing professionals who are concerned with the quality of life of the disabled person face, is the development of activities that could realistically affect integration into society.

The disabled person has rights with regard to education, instruction, training, economics, labour, politics, culture, recreation and other facilities. This applies to recreational facilities in so far as it is physically possible for the disabled to make use of them, owing to the physical relaxation and the development and health of body and mind and particularly the social development and integration which result from this (Hattingh, 1987). Wingate (1981) states that horse riding has been identified as an activity that can serve this purpose, with the additional benefit of being psychologically therapeutic.

1.3 BROAD AIMS OF THE RESEARCH

This study aims to provide a better understanding of riding therapy as conducted in South Africa by attempting to establish whether disabled children show an increase in self-concept and a shift towards an internal locus of control as a result of their participation in riding therapy.

1.4 CONCEPTUAL FRAMEWORK

The acquisition or mastery of a new skill often enhances self-concept and rehearsing a skill already mastered can help retain present self-concept (Iso-Ahola & Hatfield, quoted in Miller, 1989). This, in short, is the conceptual framework on which this study is based. The framework is schematically represented in Figure 1.1.

The physical benefits of Riding Therapy (such as improved balance, co-ordination, suppleness of muscles, decreased muscle tone etc.) has been documented extensively (Adams and McCubbin, 1991; Harpoth, 1970; Henriksen, 1971; MacKinnon et al., 1994; Mayberry, 1978; Whalley, 1980). The conceptual framework of this study is based on the theory that through improved physical functioning, these disabled children will acquire and master a new skill, namely riding therapy. This in turn will cause a change in their attitudes towards themselves (self-concept) and their attributions of cause (locus of control). A logical question would thus be: why choose riding therapy when a number of other sports could achieve the same goal? The answer lies in the unique nature of riding therapy. The disabled child is exposed to a positive, supportive but challenging environment. Riding therapy involves active exercises on horseback as well as instruction in horsemanship, horse care and stable care. Children are taught to ride and to control the horse as competently as is physically possible.

They are, however, supported by volunteer helpers who provide support when needed and is constantly supervising horse and rider.

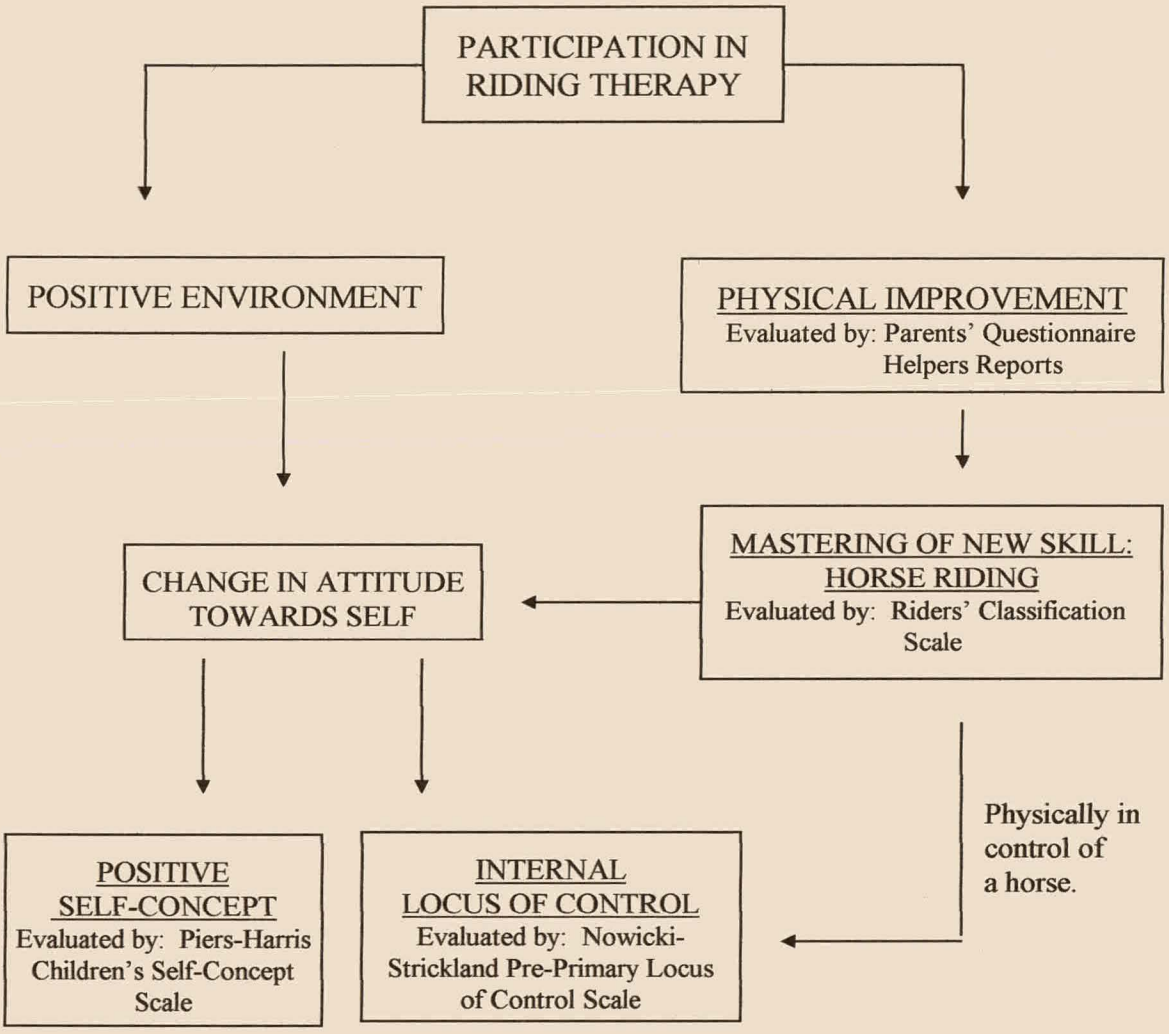


Figure 1.1: Schematic Representation of Conceptual Framework of the present study

Their goal is not to compete with other children, but to learn to control a living animal. At the same time the disabled child is momentarily set free from the

immobility, caused by his♣ disability, and can move with speed and ease for the first time in his or her life.

De Lange (1988) states that the most important goal concerning the needs of the cerebral palsied child is to help him♣ overcome his passivity and by doing so, gratifying his needs. She suggests that this may be done by means of play, creating success situations, stimulating creativity, developing opportunities for normal experiences, allowing for individualisation, creating self-acceptance and creating other interests and attitudes.

The present study aims to show whether riding therapy can be the means whereby some of the psychological and physical needs of the cerebral palsied child can be satisfied.

♣ For the purpose of this study, the term "him" refers to "him or her", unless indicated otherwise. For the purpose of this study, the term "his" refers to "his or her", unless indicated otherwise.

CHAPTER 2

THEORETICAL PRINCIPLES

2.1 THERAPEUTIC HORSE RIDING

2.1.1 The history of therapeutic horse riding

Reference to the use of horseback riding for disabled individuals has appeared in the literature for centuries. It was reported that the ancient Greeks used horse riding as a treatment for individuals who were considered untreatable or incurable in order to improve their spirits (Angier, 1983; Haskin, Erdman, Bream, MacAvoy, 1974; Mayberry, 1978;). Quellmaltz in his publication *Novum Sanitatis Praedsidium ex Equitatione, Machinae Beneficio Instituenda,* in 1735, describes therapeutic uses of the horse and includes drawings of apparatus used to mimic the movement of the horse. Brown published a rationale for horseback riding as therapy in *Elementa Medicinal* in 1870. He prescribed the riding of a spirited horse as therapy for asthenic patients (Mayberry, 1978). A study undertaken by Ghassigne in Paris in 1875 found that riding was beneficial in the treatment of hemiplegia, paraplegia, and other neurological disorders. He hypothesised that posture, balance, joint movement, and muscle control were improved by the active and passive movement of the horse (Bain, 1965).

The original interest in programmes of therapeutic riding for the disabled arose from a champion dressage rider of Scandinavia, Madame Lis Hartel. She contracted polio in 1943 and became confined to a wheelchair. Despite being severely paralysed, she rode her horse "Jubilee" to a silver medal in dressage at the 1952 Olympic Games in Helsinki (Adams and McCubbin, 1991; De Pauw, 1986; Whalley, 1980, Wood, 1990).

It was at this time that the medical profession began to show interest in the therapeutic value of horse riding. Bodtker, a Norwegian physical therapist, initiated a riding programme for individuals with post-polio and cerebral palsy (Boysen, quoted by De Pauw, 1986; Haskin et al., 1974). Since the 1950's therapeutic riding programmes have spread throughout Europe, Britain and North America and later to Australia and South Africa.

2.1.2 Divisions of horse riding for the disabled

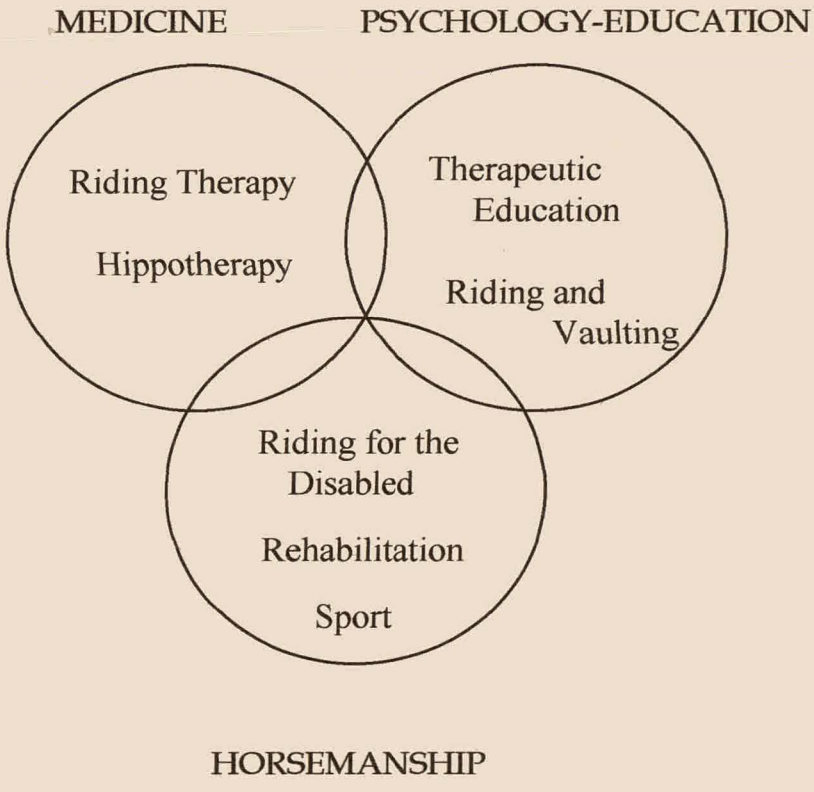


Figure 2.1 - The three-circle German model for therapeutic riding (Heipertz, quoted in Spink, 1993).

The aim of horseback riding for the disabled is to provide mental, physical and social stimulation to the disabled person's abilities as well as disabilities. Germany is one of the first countries to have developed a set of structured educational

standards to guide the activities of professionals in medical and psychological areas of therapeutic riding. Heipertz, quoted in Spink (1993) defined the three-circle model, depicted in Figure 2.1, which portrays the three most relevant areas of therapeutic riding. These areas are medicine, psychology-education, and horsemanship.

2.1.2.1 Medicine

Riding Therapy

Riding therapy refers to active physio therapeutic exercises on horseback that is prescribed to an individual. Riding therapy is conducted by a team of experts consisting of a physician, physical therapist, riding instructor and helpers (Spink, 1993).

The rider is passively influenced by the movement of the horse and actively performs exercises (Bertoti, 1988). The basic objective of riding therapy is achieved by the selection of a suitable mount (horse) and equipment, the selection of suitable exercises, and a didactic knowledge of the disability (Mayberry, 1978). The ultimate goal of riding therapy is physical improvement and emotional satisfaction. Riding therapy is usually combined with another form of physical therapy treatment. The subjects in the present study will be participating in a riding therapy programme.

Hippotherapy

Hippotherapy refers to the passive form of therapeutic riding, which aims to treat movement dysfunction. The individual sits on the horse and accommodates him or herself to the swing motions of the horse (Spink, 1993). The movements of the horse's back serve to relax the rider, strengthen muscles, and improve circulation.

This therapy should be conducted by a physical and/or trained therapist as it is a distinct medical procedure (Copeland-Fitzpatrick, 1994).

2.1.2.2 Psychology-Education

Remedial Riding and Vaulting

This form of horse riding involves educational methods through which positive changes in the behaviour of children and youth with behavioural disorders are introduced. The term vaulting refers to the performance of gymnastic exercises on horseback (De Pauw, 1986; Kroger, quoted by Wood, 1990). Other perceived benefits from remedial riding and vaulting include diminishing anxieties, building trust, improving self-esteem, building concentration, and increasing social interaction.

Learning to ride a horse has a unique value for children who are emotionally disturbed. Relating to an animal, the responsibility of care for the animal and the social organisation of a group of riders, provide a special set of experiences with deeper meanings for a child who is disturbed, self-destructive, hyperactive, passive or withdrawn (Mayberry, 1978).

2.1.2.3 Horsemanship

Riding as a sport for those with disabilities, enables the disabled person to take part in the sport of horse riding as would an able bodied♦ person. Although the intention of riding as a sport may not be therapeutic, riding train and strengthen physical functioning and help to create positive mental attitudes. Riding as a sport can increase a disabled person's integration into the community (De Pauw, 1986).

♦ For the purpose of this study, the term "able bodied" refers to children who do not suffer from any physical disability, unless indicated otherwise.

2.1.2.4 Riding as therapy

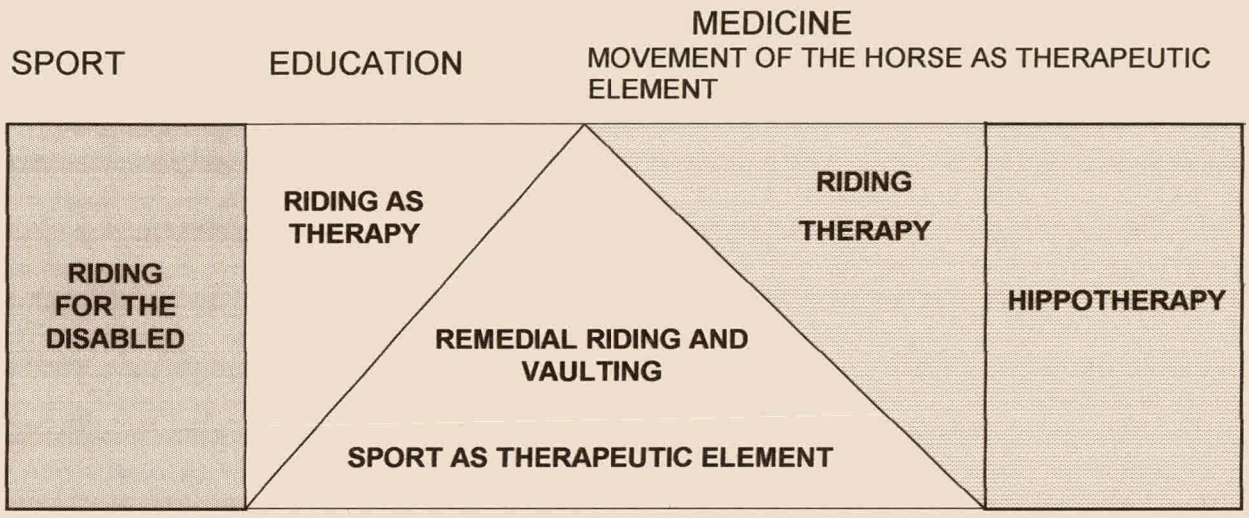


Figure 2.2: Divisions of horseback riding for the disabled (Adapted by De Pauw with permission from the Swiss Group for Hippotherapy, 1986).

De Pauw (1986) adapted, with permission, a schematic representation from the Swiss Group for Hippotherapy (1978). The representation as depicted in Figure 2.2 does not differ much from the Three-circle model (Figure 2.1), except for an additional category namely riding as therapy. The latter refers to riding used for its preventative or rehabilitative value. An example of this form of riding is its use as a form of controlled aerobic exercise under medical supervision by patients with heart, circulatory, or respiratory diseases (Glasow, quoted by De Pauw, 1986).

2.1.3 Who benefits from riding therapy?

Adams and McCubbin (1991) list a number of physical disorders which can be treated by riding therapy. Some of these disorders are: amputated limbs, lung disease, visual impairments, cardiovascular disorders, cerebral palsy, head

trauma, hip joint disorders, obesity, paraplegia, quadriplegia, progressive muscular dystrophy and rheumatoid arthritis.

It is important that programmes are managed to suit the particular disability and that groups are instructed by qualified instructors. Safety standards must be set and followed. The two largest groups of individuals who benefit from riding therapy are the mentally disabled and individuals suffering from cerebral palsy (Walker, 1978).

Most disabled persons can benefit from horse riding whatever their disability, provided that they enjoy the activity (Walker, 1978). Contra indications of therapeutic horse riding could be found in cases where participants can cause to be a danger to themselves, the horse or other riders. Examples are children or adults suffering from severe psychiatric disability, people suffering from epilepsy where seizures are not adequately controlled or children suffering from neuromuscular disability (Mayberry, 1978).

2.2 PHYSICAL DISABILITY: FOCUS ON CEREBRAL PALSY

2.2.1 Introduction

The term cerebral palsy refers to a group of disorders which have the following features in common:

a) aberrant control of movement or posture,

b) early onset, and

c) no recognised underlying progressive pathology (Nelson and Ellenberg, 1978).

Cerebral palsy is a developmental disability. The term "developmental disability" describes a group of disabilities generally associated with the neurological system.

The main characteristic of cerebral palsy is a disorder of movement or posture. Other clinical conditions such as perceptual, cognitive, seizure, and behaviour problems are usually associated with cerebral palsy (Dallas, Stevenson, and McGurk, 1993; Parker, Carriere, Hebestreit, et al., 1993). The term includes mental retardation, epilepsy, cerebral palsy, aphasia and similar clinical entities (Cruickshank, 1976). The word *developmental* refers to the fact that these disabilities are life-span problems and have to be faced at all developmental stages.

2.2.2 General Etiology

Cerebral palsy is caused by injury to the brain in early life. Estimates of the incidence of cerebral palsy in South Africa is stated as 2,5 cases per thousand live births (Hattingh, 1987). Hopkins, Bice, and Colton (quoted by Cruikchank, 1976) conducted a survey in 1951 including 1105 individuals with cerebral palsy in the State of New Jersey, U.S.A. The results of this survey concerning the etiology or cause of cerebral palsy are depicted in Table 2.2.

It is believed that this prevalence rate is much higher in Africa than in the U.S.A or Europe. The reason for this is due to rudimentary antenatal and perinatal care as well as to prevalent intracranial infections like cerebral malaria, meningitis and encephalitis. Febrile convulsions of unidentified causes are bound to reach the hospital too late. Rural clinics may lack even the most basic facilities and have insufficient staff (Potterton, 1996). These factors also determine the type of disability associated with cerebral palsy such as mental retardation, visual and hearing effects, epilepsy and speech disorders (Duggan and Ogala, 1982; Karumuna and Mgone, 1990).

Table 2.2:

Incidence and Etiology of Cerebral Palsy in the 1951 New Jersey Study (In Cruikchank, 1976).

ETIOLOGY	PERCENT
Birth Injury	38,9%
Developmental	28,5%
Post convulsive	9,3%
Prematurity	8,1%
Post infections	3,8%
Cerebral Anoxia	3,7%
Rh-factor	2,6%
Post cerebral Trauma	1,9%
Hydrocephalic Basis	1,3%
Post operative	0,8%
Post natal toxemia; Post embolic Hyperpyrexia; Petechial Hemorrhage; Hemorrhagic disease; Luetic.	less than 0,4%

Parker et al. (1993) states that at least three different processes contribute to the final disability of cerebral palsied children. The first process is the primary lesion to the nervous system which affects the child's "control" system. The second is a disturbance of muscle and bone growth. The third is the learned response of abnormal movement patterns to compensate for the neural damage. These factors affect physical fitness and gross motor performance, which may interfere with the child's daily functioning and compromise will-being and social intervention.

2.2.3 Classification of the Characteristics of Cerebral Palsy

The clinical classification of cerebral palsy is based on clinical and theoretical factors. The clinical factors include the neurological findings at examination, the presumed etiology and associated psychological and social features. The theoretical components include anatomic, pathologic, pneumo-encephalographic, and electromyographic findings. The following clinical classification attempts to accurately describe the type, location, degree of the primary disability and associated dysfunctions (Tenor in Cruikshank, 1976).

2.2.3.1 Clinical Classification

1. Spatiality (50-60 percent)

The term *spatiality* suggests a pathologic state in which motor function is impaired because of disharmony of muscle movements. Disharmony of muscle movements is caused by exaggerated contraction of muscles when the muscle is stretched.

2. Dyskinesia (20-25 percent)

Dyskinesia is characterised by involuntary motor activity that is intensified by emotional stress. There are different types of dyskinesia:

Athetosis - This type is characterised by uncontrollable, jerky, irregular, twisting movement of the arms, legs, fingers, and wrists. During activity normal movement may occur.

Chorea - Choreiform movements are more continuous, slower, more writhing and less tense in character. Movements may be limited to specific muscle groups.

Dystonia - Dystonic movements are very similar to athetosis, but the disorder of movement generally involves the trunk muscles more than the extremities.

Tremor - These movements are rhythmic and pendular and can be categorised as intentional, non-intentional, or constant.

Rigidity - Rigidity can be described as continuous in character with a constant feeling of resistance in the muscle. When resistance is interrupted, movement appears jerky. Rigidity resembles spasticity, but with spasticity there is a feeling of relaxation of muscle after the spasticity.

3. Ataxia (1-10 percent)

Ataxia can be described as an incoordination due to a primary disturbance of balance, sense, posture, and of kinesthetic feedback. There is a general inability to maintain balance with associated gross or fine motor incoordination.

4. Mixed Types (15-40 percent)

This category is characterised by various combinations of the above types of disordered movement. Most common of these are athetosis combined with spasticity, and rigidity combined with ataxia.

5. Atonia

This condition is extremely rare.

2.2.3.2 Topographic Classification

The topographics classification describes the location of the movement disorder and is used to complement the clinical designation:

1. Hemiplegia - one lateral half op the body is impaired (35-40 percent).
2. Diplegia - the legs are more involved than the arms (10-20 percent).
3. Quadriplegia - all four extremities are impaired (15-20 percent).
4. Paraplegia - only the legs are implicated (10-20 percent).
5. Monoplegia - only one limb is involved (this condition is very rare)
6. Triplegia - three limbs are involved (this condition is very rare).
7. Double Hemiplegia - both halves of the body are involved (this condition is very rare).

2.2.3.3 Degree

1. Mild - The degree of impairment is mild when only fine precision of movement is affected.
2. Moderate - The degree of impairment is moderate when gross and fine movements and speech clarity are impaired, but performance of daily activities of living is functional.
3. Severe - The degree of impairment is severe when the person is unable to adequately perform daily activities such as walking, using hands, or using speech for communication.

2.2.3.4 Classification of muscle tonus

1. Isotonis - normal tonus.

2. Hypertonic - increasing tonus.

3. Hypotonic - decreasing tonus.

4. Variable - inconsistent tonus.

2.2.3.5 Dysfunctions associated with Cerebral Palsy

Because of the relation between cerebral palsy and the central and peripheral nervous systems, physical and mental dysfunctions other than neuromuscular dysfunctions are quite common. In some cases, such associated disabilities have no relationship to the cerebral palsy and these individuals then suffer from two or more disabilities in a coincidental relationship. In most cases the symptom that caused the cerebral palsy will be the cause of associated dysfunctions (Denhoff, 1976). These associated dysfunctions are listed below:

1. Sensory: vision, hearing, smell, proprioceptive.

2. Convulsions.

3. Intellectual : cognitive deficits.

4. Perceptual: visual, auditory.

5. Behavioural: hyperkinetic impulse disorder, neurotic, anxiety, withdrawal, acting out.

6. Learning: specific disabilities, secondary to above disorders.

7. Emotional: primary associated with family or biological factors, secondary to the above disorders.

2.2.3 The Target Group Representing the Present Study

The disabled subjects participating in this study share the following characteristics:

a) All of these subjects suffer from spatiality, and

b) some of the subjects did show signs of ridigity, dystonia and athetosis. One suffers from degenerative ataxia. The degree of disability ranges from mild to moderate. Subjects with intellectual and perceptual dysfunctions are excluded from the study. Some of the subjects suffer from mild sensory and learning dysfunctions.The topographic classification of the subjects of the present study is depicted in Table 2.2.

Table 2.2

The Topographic Classification of subjects in the present study.

Topographic Classification	Number of Subjects
Hemiplegic	5
Diplegic	5
Quadriplegic	1
Triplegic	1

2.3 DEVELOPMENT OF THE CEREBRAL PALSIED CHILD DURING MIDDLE CHILDHOOD

2.3.1 Middle Childhood Defined

Lefrancois (1995) defines middle childhood as a period of development ranging from the approximate age of six to twelve years. This stage ends with the onset of puberty, therefore its upper boundary is more indefinite. Important developmental and psychological changes take place during the middle childhood years. These changes are discussed in the next section.

2.3.2 Cognitive Development

Jean Piaget (1896 - 1980) was one of the greatest influences concerning intellectual development. According to Piaget, intelligence is a characteristic of all living organisms (Strommen, McKinney, and Fitzgerald, 1983). Human cognition is described as a network of mental structures created by an active organism constantly striving to make sense of experience. Piaget's vision of the child, is that of an intrinsically motivated learner (Berk, 1994). He developed a series of stages of cognitive development that stretches from birth to approximately fifteen years.

Children approach Piaget's concrete operation stage (middle childhood), by way of the sensorimotor period (birth to 2 years) and the two preoperational periods (2-4 years and 4-7 years). According to Piaget, childrens' cognition at the end of the intuitive period is egocentric, perception dominated, and intuitive. During middle childhood previous errors in logic and deficiencies are replaced by improved logical thinking.

As mentioned in the previous section, cerebral palsy is associated with secondary disorders such as below average intellectual functioning, speech defects, hearing loss, visual problems, behaviour disorders and even mental retardation

(Cruickshank, 1976). These impairments can have serious implications regarding cognitive development.

Emotional and social growth can be affected by speech defects, as communication is essential to learning and developing human relationships.Visual and hearing problems can result in a loss of early learning experiences. Cognitive development in cerebral palsied children is hampered by neurological brain damage and by restricted ability to explore the environment because of the above mentioned physical impairments (Irish and Skuy, in Rees, 1981).

2.3.3 Development of Social Cognition

According to developmental psychologists (Berk, 1994; Lefrancois, 1995) there is an increase in emotional development in the middle childhood years due to a growth in self-awareness and social sensitivity. Infants start developing social cognition when they begin to differentiate between themselves and others. In the pre-school years, children develop an implicit theory of mind. This theory of mind is based on the understanding that others have mental states that can be described in terms of thoughts, emotions, wishes, and beliefs (Lefrancois, 1995). Children start to understand and verbalise the mental states of others in the middle childhood years.

Selman (1980) describes this ability in five stages. From birth to six years, children are in an egocentric stage where the child believes that everyone feels the same way that he/she does. According to Selman (1980) there are three states of social cognition in the middle childhood years. In the social informational state (six to eight years) children become aware that others have different points of view, but they have no understanding for the reasons of this view. From eight to ten years, the child is self-reflective. The child becomes aware of the individual's point of view, but can only respond to one of the other individuals involved. In a mutual state (ten to twelve years) children can effortlessly switch from one point of view to another. From adolescents onwards, children use the principles and ideals of

their social environment to analyse and evaluate their own and other's perspectives.

Children in middle childhood start experiencing complex emotions, are more aware of their own emotional state and those of others, and experience increased self-regulation (Berk, 1993). Complex emotions such as pride and guilt are integrated with increased social responsibility. At the end of middle childhood, the child has an understanding of the experience of emotions.

Children learn to handle emotionally arousing situations through emotional self-regulation. In middle childhood, there is an improvement in the child's recognition of and response to their own feelings as well as those of others.

Cerebral palsied children might have great difficulties with developing social cognition. Cerebral palsy, as associated with brain damage, can lead to emotional disturbances such as disproportionate and intense behaviour. Such behaviour often results in negative consequences in terms of the social and physial environment (Rees, 1981).

2.3.4 Psycho-Social Development

Erik Erikson is one of the most important Neo-Freudians in the field of child development. Erikson expanded Freud's basic psychosexual framework by emphasising the psychosocial outcomes of development and by pointing out that normal development must be understood in relation to each culture's unique situation. He accepted Freud's stages of psychosexual development, but formulated stages of psychosocial development that are equally important for understanding personality development.

Erikson's stages of psychosocial development refer to predominant patterns of social interaction representative of different periods of life (Strommen, McKinney, and Fitzgerald, 1983). He suggests that there are eight stages of psychosocial

development that covers the entire life span. The first five of these stages correspond roughly in time to Freud's psychosexual developmental stages. Each of Erikson's stages is dominated by a predominant theme that has a positive and a negative extreme. If the balance of interactions within each stage is positive, the positive dimension will prevail, but if the balance is negative, the negative dimension will prevail.

According to Erikson, the combination of adult expectations and children's' drive toward ability and competence amounts to the perfect setting for the critical psychological conflict of the middle childhood years (6-11 years) : industry versus inferiority. By using the word "industry," Erikson refers to the competence to successfully complete useful skills and tasks. Competence has roots in earlier years but it is during the middle childhood years that it becomes central to personality development (Strommen, McKinney, and Fitzgerald, 1983).

Erikson's sense of industry combines several critical developments of middle childhood: a positive but realistic self-concept, pride in doing things well, moral responsibility, and cooperative participation with age mates (Berk, 1993). The transition to middle childhood is marked by the beginning of formal schooling in industrialised nations. Children are provided with the widest possible preparation for different careers in society. They become aware of their own and their peers' unique capacities. At this time a sense of inferiority can develop if a child comes to believe that he or she will never be good at anything. This sense of inadequacy can develop when family life did not prepare children for school life or when experiences with teachers and peers are so negative that they destroy children's feelings of competence and mastery (Berk, 1994).

Because of the nature of their disability, some cerebral palsied children might not be able to master all tasks that normal children execute. This excludes them from receiving positive feedback and leads to feelings of inferiority. Consequently the disabled child may carry out fewer behaviours and tend not to exert himself (Rees,

1981). A number of cerebral palsied children will therefore find Erikson's "industry" versus "inferiority" stage very difficult to complete successfully.

The predominant negative response of the community towards disabled persons being inferior to normal persons is not new. When one percieves one-self as inferior, self-expectations are lowered (Wright, 1960).

Disabled children have the same emotional and social needs as "normal" children and experience the same adjustment problems if these needs are not fulfilled (Cruickshank, 1976). It is therefore clear that the cerebral palsied child is at risk in the development of a healthy self-concept and locus of control orientation. This is discussed in the following section.

2.4 SELF-CONCEPT

Self-concept is a basic concept in modern humanistic psychology and may be described as a developmental phenomenon formed over time (Zemke, Knoth, and Chase, 1984). Self-concept, like many other psychological constructs, suffers in that "everybody knows what it is." Researchers often do not provide any theoretical definitions of what they are measuring (Marsh, Richards, and Barnes, 1986). For this reason, a comprehensive summary of various definitions of the term *self-concept* follows, as well as a working definition applicable to this study.

2.4.1 Defining Self-Concept

2.4.1.1 Distinguishing between self-concept and self-esteem

Distinguishing between the constructs self-concept and self-esteem is no simple matter. Several researchers distinguish very clearly between the two constructs. They tend to use the term *self-concept* to describe the perceptions people have about themselves and the effects that accompanies those thoughts. The term self-

esteem is commonly seen as an self-evaluative aspect of self-concept in the sense that self-esteem is determined by the evaluations or judgements people place on their perceptions of themselves (Shilling, 1986).

Fleming and Courtney (1984) states that several self-concept measures do seem to measure more than just self-esteem. The Piers-Harris Children's Self-concept Scale (1984) is a good example of such a scale. It is a multidimentional instrument which includes "adjustment" and self-esteem items such as anxiety and happiness.

2.4.1.2 Some Definitions

Piers (1984) defines self-concept as a relatively stable set of self-attitudes reflecting both a description and an evaluation of one's own behaviour and attributes. Rogers (1951) defined the self as "...an organised, fluid, but consistent conceptual pattern of perceptions of characteristics and relationships of the `I' or the `me', together with values attached to these concepts" (p.498). He stated that self-concept includes only those characteristics of the individual that he is aware of and over which he believes he exercises control. There is also a constant basic need to maintain and enhance the self.

Allport (1955) prescribed the following attributes to self-concept:

1. Awareness of a bodily self;
2. A sense of continuity over time;
3. Ego enhancement, or a need for self-esteem;
4. Ego extension, or the identification of the self beyond the borders of the body;
5. Rational process, or the synthesis of inner needs with outer reality;
6. Self-image, or the person's perception and evaluation of himself as an object of knowledge;

7. The self as knower, or as an executive agent;

8. Propriate striving, or the motivation to increase rather than decrease tension, and to expand awareness and seek out challenges.

Rosenberg (1979) states that self-concept is not a collection, but an organisation of parts, pieces, and components that are hierarchically organised and complexly interrelated. He also notes that a person's global self-attitudes and its components are not interchangeable. These factors exist both within the individual's phenomenological field as separate and distinguishable entities.

According to Burns (1979) self-concept is the person's view or image of himself. More specifically it is a person's attitudes, feelings and knowledge about his abilities, skills, appearance and social acceptability.

Combs (quoted in Zemke et al., 1984) defines self-concept in phenomenological terms as a individual's personal experience of self. It can be described as "...an organisation of meanings or perceptions comprising the person's experiential self." Shavelson, Hubner and Stanton (1976) defines self-concept as:

(a) organised,

(b) multifaceted,

(c) hierarchical,

(d) stable (when considered as a general construct) and unstable (situationally),

(e) developmental (in that factors become more differentiated with age),

(f) evaluative, and

(g) differentiable from related constructs (such as social desirability, anxiety, intelligence, and locus of control).

With regards to the present study, the Piers-Harris Children's Self-Concept Scale is used as an instrument to measure self-concept. For this reason, Piers's (1984) definition of self-concept served as a working definition in this study. According to Piers (1984) self-concept can be described as: "...a relatively stable set of self-attitudes reflecting both a description and an evaluation of one's own behaviour and attributes." Because this instrument focuses on childrens' conscious self-perceptions, it is consistent with a phenomenological view of self-concept. The term "self-concept", as used by Piers (1984), is interchangeable with the terms "self-esteem" and "self-regard," respectively.

2.4.2 The Nature of the Self-Concept

2.4.2.1 Defining the Nature of the Self-Concept

Epstein (1973) was one of the first researchers to comprehensively study the *nature* of self-concept by studying the work of a variety of psychologists. His conclusion regarding of the *nature* of the self-concept can be summarised as follows:

1. It is a sub-system of internally consistent, hierarchically organised concepts, obtained within a broader conceptual system.

2. It contains different empirical selves, such as a body self, a spiritual self and a social self.

3. The self-concept is a dynamic organisation that changes with experience.

4. The self-concept develops out of experience, particularly out of social interaction with significant others.

5. It is essential for the functioning of an individual that the organisation of his self-concept be maintained. When this organisation is threatened, the individual could experience anxiety.

6. There is a basic need for self-esteem which relates to all aspects of the self-system.

7. Self-concept organises data of experience, particularly experience involving social interaction, into predictable sequences of action and reaction. It also facilitates attempts to fulfill needs while avoiding disapproval and anxiety.

2.4.2.2 Theoretical Models of Self-Concept

There is major disagreement among theorists concerning the structure of within-network relations with respect to a stable general facet of self-concept and the more specific facets of the construct. In this regard, Byrne (1984) distinguishes between four theoretical models of self-concept:

The Nomothetic Model

This model describes self-concept as a unidimensional construct. It is the first perspective concerning self-concept. Characteristics descriptive of a general self-concept are used to explain a person's behaviour in various situations.

The Hierarchical Model

Shavelson et al. (1976) reviewed theoretical and empirical research and developed the Hierarchical Model of self-concept. The Shavelson Model (Figure 2.3) proposes emotional, social, physical, and academic components of self-concept. A distinction is made between academic self-concept and non-academic self-concept (emotional, social, and physical self-concept). At the apex of the hierarchy is the general self-concept, which is determined by the secondary constructs namely the

academic and the non-academic self-concepts. These are in turn determined by the lower order components which represent more specific competencies and are determined by an evaluation of behaviour in specific situations (Fleming and Courtney, 1984). It is hypothesised that the general self-concept is the most stable facet and that stability decreases upon descending the hierarchy.

When Shavelson et al. (1976) proposed their model, there was little empirical support for the multi-dimensionality of self-concept (Marsh, 1989). Subsequent empirical research has shown overwhelming support for this model (Byrne, 1984; Fleming and Courtney, 1984; Marsh, 1989; Marsh, Richards, and Barnes, 1986).

The Taxonomic Model

This model supports the notion that self-concept is structured as a series of highly specific facets that are relatively independent of each other. Soares and Soares (in Byrne, 1984) identifies a basic general factor of self-concept in addition to semi-autonomous factors. A person thus holds a self-concept for every aspect of life. Several studies have established self-concept within the taxonomic framework (Strang, Smith, and Rogers, 1978; Winne, Marx, and Taylor, 1977; Winne, Woodlands, and Wong, 1982).

The Compensatory Model

Winne et al. (1977) proposed the Compensatory Model. This perspective supports a general facet of self-concept. It also suggests that the specific facets of self-concept are inversely related, rather than proportionally (as in the hierarchical model) or independently related (as in the taxonomic model).

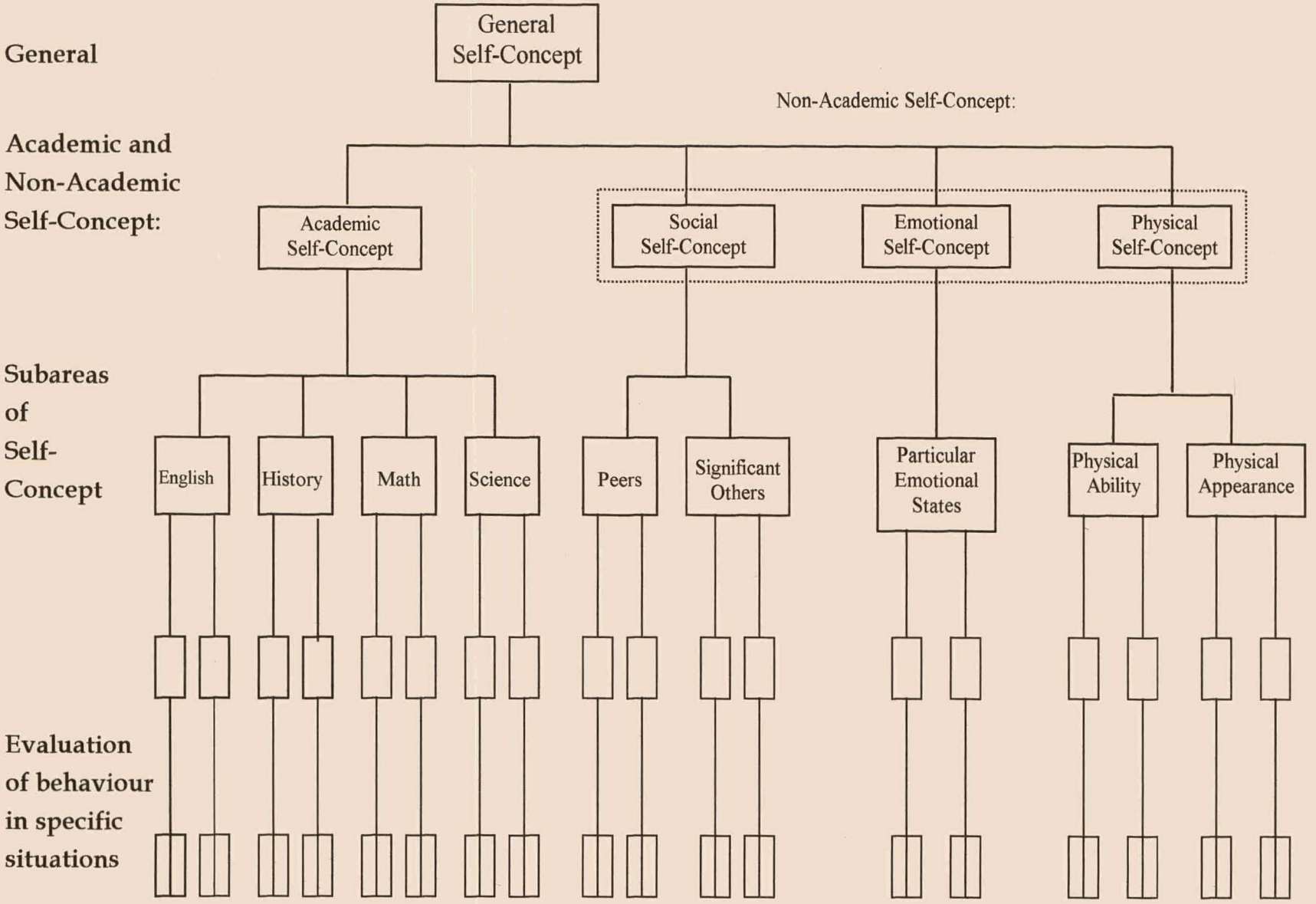


Figure 2.3: The Hierarchical Facet Model of Self-Concept (Shavelson et al., 1976; p. 413).

A lower status on one facet of self-concept may be compensated for by a higher status on another facet of self-concept. Various studies such as Strang et al. (1978), and Ross and Parker (1980) support the Compensatory Model.

2.4.2.3 Summary

Self-concept can be described as a multifaceted, hierarchically ordered construct that becomes increasingly differentiated with age (Marsh, 1986).

A person's self-concept is relatively stable over time. Basic self-concept and particular facets of self-concept are based on a wide range of experiences and these usually have only a mild effect of self-concept (Marsh and Richards, 1986). Self-concept cannot be perfectly stable over time and still be responsive to dramatic life events or interventions. For this reason Markus and Kunda (1986) suggest the dual nature of self-concept: stable but malleable.

Although many researchers view self-concept as not only stable, but unresponsive to variation, the essentially social nature of self-concept cannot be denied. In their study, Markus and Kunda (1986) propose that the stability of self-concept masks significant local variations that arise when the individual responds systematically to social events.

2.4.3 Development of Self-Concept

Self-concept is a developmental phenomenon, formed over time (Zemke, et al., 1984). Several transformations in self-understanding take place in the middle childhood years. Firstly, children became capable of describing themselves in psychological terms. Secondly, they start comparing their own characteristics to

those of their friends. Thirdly, they start to speculate about the causes of their strengths and weaknesses (Berk, 1993).

Burns (1979) suggests five vitally important sources of input to the developing self-concept (Figure 2.5). Their importance varies at different developmental stages. The five sources are:

1. Body image - an evaluation of the physical self as a distinct object.
2. Language - the ability to conceptualise and verbalise about self and others.
3. Environmental feedback - interpreting feedback from the environment about how the person stands relative to various societal norms and values.
4. Sex role identification - identification with the appropriate sex role model and stereotype.
5. Child-rearing practices.

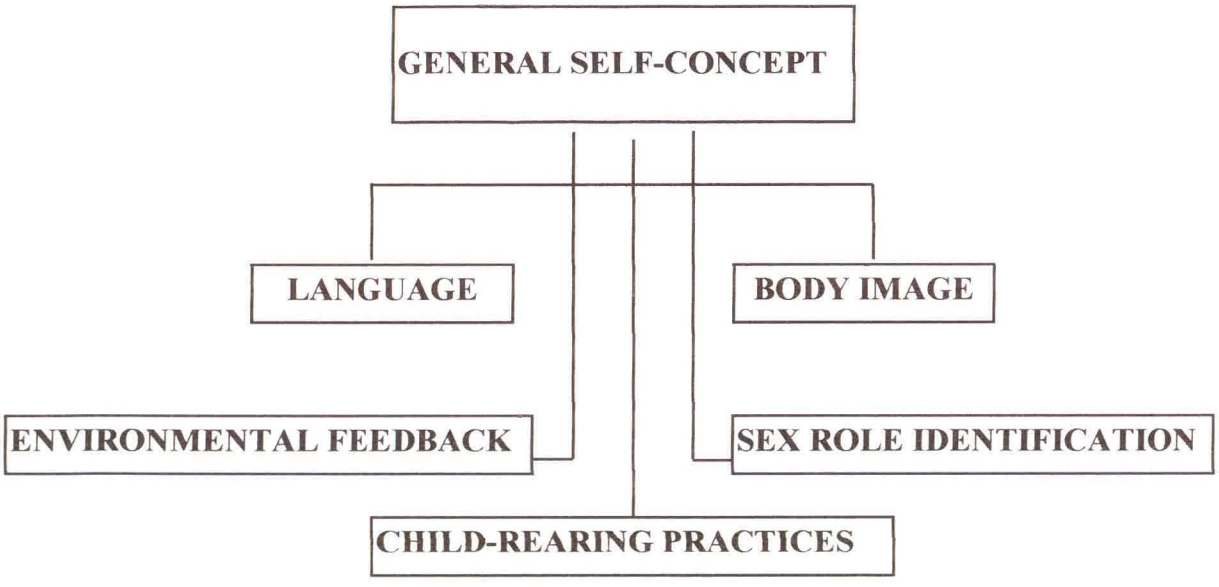


Figure 2.4: Five sources of input to the developing self-concept (Burns, 1979, p. 150).

Cerebral palsied children in general have significant problems concerning the above sources of input. Body image might be distorted because of inferior physical ability and deformed appearance. Speech impairments are common among cerebral palsied children and feedback from the community concerning disability is seldom positive. Several parents have difficulty in coping with raising a disabled child and do not set strong examples for the child to identify with. Disabled children often experience negative feedback because of society's attitude toward the disabled in the community (Wright, 1960).

2.4.4 Influences on Self-Concept in the Middle Childhood Years

Berk (1994) states that there are various factors that influence the self-concept in middle childhood years. Child-rearing practices are important. Children with warm, responsive parents who provide firm but reasonable expectations for behaviour, feel especially good about themselves. Making attributions by reasoning about the causes of success and failure are crucial developmental characteristics of middle childhood. Cognitive development allows children to recognise and separate these variables in explaining their performance.

2.5 LOCUS OF CONTROL

2.5.1 Defining Locus of Control

Internal-external (IE) expectancies are firmly embedded within Rotter's social learning theory (Rotter,1954). This theory states that the IE construct can be described as a generalised expectancy, operating across a wide variety of situations, regarding the degree to which a person believes that he possesses or lacks the power to control the occurrence of reinforcing events.

Strickland (1989) describes an internal orientation as perceiving a contingency between one's own behaviour and subsequent events. Persons holding an external orientation are more likely to construe events as resulting from luck, chance, fate or powers beyond their personal control.

The locus of control construct is related to various forms of behavioural effectiveness (Epstein and Komorita, 1971). Recent studies have shown that, compared to externally orientated subjects, internally orientated subjects are more likely to:

(a) demonstrate effective coping behaviour,

(b) have objective information about their current situation,

(c) have a positive self-concept (Epstein and Komorita, 1972; Fleming and Watts, 1980),

(d) obtain higher scores on achievement tests (Nowicki and Strickland, 1973; Wildstein and Thompson, 1989).

Research has also shown that locus of control becomes more internalised with age and that internality is associated with higher social class (Nowicki and Strickland, 1973).

2.5.2 Self-Expectations: The Attribution Theory

According to Lefrancois (1995) an attribution is an assignment of cause or blame for the outcomes of our behaviour. Attribution theories look for predictable regularities in the ways we attribute causes to the things that happen around us or to us.

Attributions can be grouped in two broad categories: external environmental causes and internal, psychological causes. The category of internal causes can

then be divided into two types, namely ability and effort. The category of external causes can also be divided into two types, namely task difficulty and luck (Figure 2.5). Certain rules are used in assigning a cause to a behaviour (Berk, 1994). If behaviour occurs for many people, but only in a single situation, we conclude that it is externally caused (by task difficulty and/or luck). If an individual displays behaviour in many different situations, we assume the behaviour to be internally caused (by ability, effort or both).

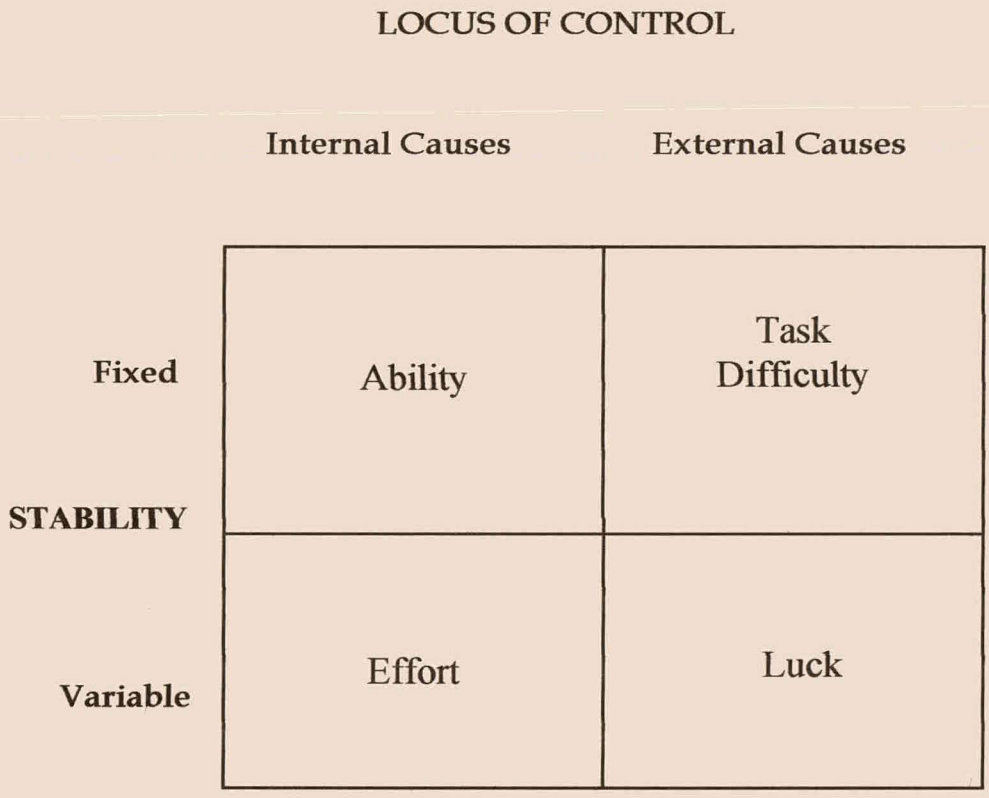


Figure 2.5: The perceived determinants of success and failure (Weiner, Heckhausen, Meyer, and Cook, 1972).

2.5.3 Mastery-oriented versus Learned Helpless Children

Mastery-orientated attributions are attributions that credit success to high ability and failure to insufficient effort. This leads to high expectancies of success and a willingness to approach challenging tasks. Children who tend to persist at challenging tasks (achievement motivation) develop mastery-orientated attributions. These children have an industrious, persistent, and enthusiastic approach to learning, regardless of success or failure (Lefrancois, 1995).

The term learned helplessness is used to describe attributions that credit success to luck and failure to low ability. Learned helpless children believe that ability is a fixed characteristic of the self that cannot be changed. These children do not develop the metacognitive and self-regulatory skills that are necessary for high achievement (Berk, 1994).

2.5.4 Influences on Locus of Control Orientation

Children develop attributions by evaluating the messages they receive from parents, teachers and peers. Adult feedback therefore has a potentially powerful impact on children's' attributional style. Low-income ethnic minority children are vulnerable to learned helplessness due to fact that cultural values for achievement might affect the child's effort to achieve (Berk, 1993). These children might attribute failure to adversity (sosio-economic status or adverse family situations) rather than insufficient effort.

2.5.5 Changing and Retraining Attributions

Berk (1994) defines attribution retraining as an effective approach to intervention that encourages learned helpless children to believe that they can overcome failure

if only they exert more effort. Children are asked to work on tasks that are difficult enough so that some failure experiences are bound to occur. They then receive repeated positive feedback that helps them revise their attributions (Lefrancois, 1995).

CHAPTER 3

LITERATURE SURVEY

3.1 INTRODUCTION

This chapter contains a summary of literature relevant to this study. Studies investigating aspects of riding therapy, disability, self-concept and locus of control orientation are discussed as well as factors that could influence these variables.

3.2 RIDING THERAPY

3.2.1 The Rationale behind Riding Therapy

The rationale for riding therapy is that the horse's movement imparts a precise, smooth, rhythmic pattern of movement to the rider. As the horse walks, its center of gravity is displaced three-dimensionally with a movement which is similar to the action of the human pelvis during gait. The warmth of the horse coupled with this rhythmical movement is thought to be useful in reducing increased muscle tone, common to children suffering from cerebral palsy, and promoting relaxation (Bertoti, 1988).

Riding therapy aims to develop compensatory balance and co-ordination patterns. The rider aligns his centre of balance with that of the horse and learns to maintain his balance by adjusting his body to compensate for the horse's movement (Adams and McCubbin, 1991). Riding therapy exercises mobilise the disabled person's trunk while co-ordinating the action of various muscle groups.

Riding therapy provides an opportunity for disabled persons to benefit physically and emotionally. The emphasis tends to shift according to individual needs (Wood, 1990). Whalley (1980) states that riding therapy encourages the disabled to lead fuller lives and to participate in activities in which non-disabled individuals also take part.

3.2.2 The Therapeutic Benefits of Riding Therapy

The therapeutic benefits of riding therapy can be divided into two categories, namely psychological benefits and physical benefits. The studies listed in Table 3.3, as well as the views of several other authors concerning the benefits of riding therapy, are discussed in this section.

Participation in riding therapy encourages the disabled to become socially active. They meet many new people, including instructors, the helpers, parents of other riders and the other riders themselves, in an atmosphere which is far from that of a home or school environment.

The "treatment" is not presented in a treatment setting. Horse riding is a sport of non-handicapped children and often the disabled riders feel superior to their peers who do not ride (Haskin et al., 1974).

3.2.2.1 Investigating the benefits of riding therapy

Rieger (1978) surveyed the scientific fundamentals of hippo- and riding therapy for its therapeutic values, particularly in cerebral palsy. He investigated studies concerning the influence of horse riding on posture and balance reactions, position of the pelvis and postures of the head and trunk, as demonstrated in film studies. Other testing media included electro-myographic examinations of antagonistic muscle groups, kinesiologic analyses by means of a video recorder as well as motor

tests to evaluate balance control and co-ordination. The results confirm that riding therapy has a positive influence on the neuromuscular dysfunction in cerebral movement disorders. There was a lasting improvement of motor and intellectual abilities which revealed that motivation was a driving force.

Table 3.1:

Studies investigating the benefits of riding therapy

Study	Sample	Age	Variables Investigated
Rieger, C (1978)	Investigated several European studies regarding riding therapy	Middle Childhood	Posture and balance reactions Posture of head, trunck and pelvis
Wingate (1982)	Cerebral Palsy (USA)	6-9; 16 years N=7	Physical Improvements Psychosocial Improvements
Carlson (1983)	Learning Disabled male students	Grades 6-11 N=24	Self-Concept (Piers-Harris S/C Scale) Locus of Control ($p<0,05$) (Nowicki-Strickland L.O.C Scale)
Bertoti (1988)	Cerebral Palsy (USA)	2-9 years N=11	Posture ($p<0,05$)
Cawley, Cawley & Retter (1994)	Emotional handicap Mentally retarded Learning disabled	11-17 years N=29	Self-Concept (Piers-Harris Self-Concept Scale)
MacKinnon Noh, McPhail, Lariviere (1994)	Cerebral Palsy (USA)	N=19	Gross motor control Posture Fine motor control Psychosocial changes

Wingate (1982) investigated the feasibility of a riding therapy programme for disabled children. Seven cerebral palsied children between the ages of 6 and 9 (and one 16 year old) participated in ten riding therapy sessions. The study investigated physical and psychosocial changes by means of the parents' observations at home. These subjectively observed improvements include improved posture, less falling when walking, improved sitting posture, head control and gait. Psychosocial improvements include improved self-image and enjoyment of the programme. Wingate (1982) states that the success of the programme, as measured in terms of the enjoyment by participants, attendance, and satisfactory volunteer participation can be considered evidence of the feasibility of the riding therapy programme.

Carlson (1983) investigated the effects of riding therapy on the self-concept and locus of control orientation of learning disabled students, aged grade 6 to 11. The study made use of a non-participating control group. The Piers-Harris Children's' Self-Concept Scale and the Nowicki-Strickland Locus of Control Scale was administered. The post-test data collection commenced after 10 weeks of riding therapy. There was no significant improvement in self-concept but locus of control scores improved significantly ($p < 0,02$) and became more internal. Internal locus of control was positively related to high self-concept scores.

Bertoti (1988) investigated the effect of riding therapy on the posture of cerebral palsied children. Eleven children between the ages of 2 and 9 participated in a riding therapy programme. The results of the study show that posture improved significantly ($p < 0,05$). Children with spastic diplegia demonstrated an overall improvement, while children with spastic quadriplegia demonstrated more improvement in the proximal head, neck, shoulder and scapula areas than in the trunk, spine and pelvis.

A study by Cawley et al. (1994) investigated the influence of riding therapy on the self-concept of 29 adolescents between the ages of 11 and 17, with severe emotional

handicaps, mental retardation or a learning disability. The subjects participated in an eight week programme and were then evaluated using the Piers-Harris Children's Self-Concept Scale. Although the post-test scores are on average higher than the pre-test scores, the difference is not significant. There was a significant improvement in the Behaviour Sub-scale scores. This scale reflects the extent to which a child admits or denies problematic behaviour and may indicate a lessening in behavioural problems.

MacKinnon, Noh, Lariviere and McPhail (1994) investigated the influence of riding therapy on 19 cerebral palsied children, who were categorised as mild or moderately disabled. The study investigated socialisation and activities of daily living by using the Adaptive Behaviour Scale (Sparrow, Balla, and Cicchetti, in MacKinnon et al., 1994) and the Socialisation sub-scale of the Vineland Socialisation Scale. It also investigated global behaviour by using the Child Behaviour Checklist (Achenbach & Edelbrock, in MacKinnon et al., 1994). Posture was assessed by a modified scale developed from Bertoti (1988). Statistical analyses of each measure indicated no significant changes from pre to post-test in both disabled groups. Observations and feedback from the parents of the subjects were very positive and are discussed in sections 3.2.2.2 and 3.2.2.3 of the present study.

3.2.2.2 Physical Benefits of Riding Therapy

Literature concerning riding therapy is filled with the possible physical benefits which could result from riding therapy. These are summarised below:

(i) Parents and instructors of participants of riding therapy as well as authors noted improvements in balance, co-ordination, flexibility, body awareness, agility and relaxation. Children find it easier to, for example, stand on one leg, can stretch further and can widen legs more than before (Adams and

McCubbin, 1991; Harpoth, 1970; Henriksen, 1971; MacKinnon et al., 1994; Mayberry, 1978; Whalley, 1980).

(ii) Improvement of muscle tone, muscular control as well as increased strength were reported by parents of cerebral palsy children who participate in riding therapy (MacKinnon et al., 1994; Mayberry, 1978; Whalley, 1980).

(iii) Several authors are convinced that riding therapy helps the disabled child to adjust to his disability by improving balance, co-ordination and posture (Whalley, 1980).

(iv) Disabled persons do not often get the opportunity to participate in a physical sport. Riding therapy, being a physical sport, improves heart function and breathing and increases circulation throughout the body (Angier, 1983; Henriksen, 1971; Mayberry, 1978).

3.2.2.3 Psychological Benefits of Riding Therapy

As with the section above, literature concerning riding therapy is filled with the observed psychological benefits riding therapy These are summarised below:

(i) Parents reported that their childrens' social skills and general behaviour improved (MacKinnon et al., 1994).

(ii) Riding therapy opens a new area of interest for disabled children (MacKinnon et al., 1994).

(iii) Disabled children participating in riding therapy seem less fearful and more self assured (MacKinnon et al., 1994).

(iv) Several authors mention that riding therapy improves self-respect, courage, motivation, feelings of euphoria, self-control, sense of self-achievement, concentration and body image. The rider is constantly achieving a new goal, however small it may be (Mayberry, 1978; Walker, 1978; Whalley, 1980).

(v) Children who participate in riding therapy forms an emotional bond with their horse and this is thought to enhance a positive emotional outlook and interpersonal relationships (Angier, 1983; Harpoth, 1970; Walker, 1978; Woods, 1990).

(vi) Riding therapy mobilises the disabled person and does much to free him or her from the disability (Henrikson, 1977; Walker, 1978).

(vii) Woods (1990) states that riding therapy teaches riders to be more assertive and provide them to be in control of a situation.

3.2.3 Conclusion

It is clear from the subjective observations of parents and riding therapy instructors that disabled children may benefit psychologically and physically from riding therapy. However, there seem to be no clear cut result were riding therapy is concerned. Authors tend to see the results of riding therapy as all-inclusive. Results, although similar for various studies, are diverse.

3.3 THE RELATIONSHIP BETWEEN CHILDHOOD DISABILITY AND SELF-CONCEPT

3.3.1 Investigating Childhood Disability

According to Harper (1991), research involving childhood disability has been plagued by a number of major and significant confounds. These confounds can be summarised as follows:

1. Children's' responses to disease or disability are interpreted by psycho-pathological models and viewed as personality disturbances or emotional disorders. Adjustment is viewed as a static concept, is often measured by personality instruments, and is often confused with adaptability. Adaptibility to disability changes for individuals over time and appears worse or better at particular times.

2. It is often assumed that there is a direct relationship between disability and psycho-social functioning as well as the severity of the disease and general adjustment. Existing data suggest that these assumptions are overemphasised but that there is, however, an increased risk for psychiatric disorders during childhood when chronic health problems are present.

3. Research in chronic disability has suffered from the "difference/deficit" or "we/they" strategy. Studies tend to try and establish baseline differences in performance between the able bodied† and the disabled. It assumes that disability imposes more homogeneity among its members because of health impaired conditions. Data suggest that heterogeneity of response to disabling conditions is more common.

† The term "able bodied" refers to children who are not physically disabled in any way.

Harper suggests that a developmental perspective is crucial in understanding chronic illness and disability in children and adolescents. He states that a developmental or lifespan focus implies an awareness of the fluid and evolving nature of child and adolescent growth and the particular stage of the individual child's current physical, cognitive and sociological status.

3.3.2 Childhood Disability and Self-Concept – A Literature Review

It is believed that a person's self-concept originates from various sources, such as a person's perception of his actual and ideal self, perceptions of the attitudes of others, and attributional factors. Discrepancies between the actual and ideal self is believed to have a negative influence on self-concept (Horney and Pope, in Arnold and Chapman, 1992). It is often assumed that people with physical disabilities have a lower self-concept than able bodied persons (Arnold and Chapman, 1992; Brinkmann and Hoskins, 1979; Harvey and Greenway, 1984). However, studies by Appleton et al. (1994), Arnold and Chapman (1992), King et al. (1993) and Magill-Evans and Restall (1991) failed to find differences between the self-concepts of able bodied and disabled children and adolescents.

3.3.2.1 Disability, Self-Concept and Physical Functioning

Brinkmann and Hoskins (1979) investigated the level of physical conditioning as a determinant of physical fitness and functional status, and self-concept as a determinant of behaviour in seven hemiplegic cerebral palsied patients participating in a rehabilitation programme. The seven participants reflected a devaluation of self when compared to able bodied subjects. The subjects participated in three 30 minute sessions per week for twelve weeks. The subjects' self-concept showed significant improvement in the following sub-scales of the Tennessee Self-Concept Scale: Identity Scale, Physical Self Scale, Personal Self Scale, and Social Self Scale. The authors conclude that the improvements of self-concept is

a result of a revaluation in self-concept, resulting from participation in a physical conditioning programme which brought on improved physical and functional status.

Table 3.2:

Studies investigating the relationship between disability and self-concept

Study	Sample	Age	Measuring Instrument	p
Brinkman & Hoskins (1979)	Hemiplegic/Able Bodied control Group (USA)	22-49 years (n=7)	Tennessee Self-Concept Scale	p<0,1
Harvey & Greenway (1984)	Physically Disabled/ Able Bodied Control group (New Zealand)	9-11 years n=51	Piers-Harris Self-Concept Scale	p<0,01
Magill-Evans & Restall (1991)	Cerebral Palsied Longitudinal Study with Control group	n=22 Canada	Tennessee Self-Concept Scale	p>0,05
Arnold & Chapman (1992)	Physically Disabled/ Able Bodied Control Group	15-17 years n=15 (UK)	Rosenberg Self-Esteem Scale Your Future Questionnaire	p>0,05
King, Shultz Steel, Gilpin & Cathers (1993)	Physically Disabled/ Able Bodied Controls	14-18 years n=53 Canada	Harter Self-Perception Profile for adolescents	p>0,1
Appleton et al. (1994)	Spina Bifida/Able Bodied Controls	7-18 years n=79 (UK)	Harter Self-Perception Profile	p>0,05

3.3.2.2 Mainstream versus Special Schools

Harvey and Greenway (1984) found significant differences between the Piers-Harris Self-Concept Scale scores of disabled children and their closest (in age) able bodied siblings. They found that school placement (maintream or special school) had no significant effect on the self-concept of disabled children. There was, however, a trend for self-concept scores to be higher among the special school group, especially scores of the physical appearance and attributes sub-scale. Two possible reasons for the difference are considered. It could an indication of a lack of realism on the part of the child in a special school who is isolated from able bodied children. Disabled children in normal schools could be described as more realistic as they are continually being compared to able bodied children.

Appleton et al. (1994) found a significant difference between various self-rated competence measures of children and adolescents with spina bifida who attended mainstream schools and their mainstream abled bodied peers. Areas of difference ($p < 0,05$) were general intellectual ability, reading, writing and mathematical competence, social acceptance, and athletic competence. The difference between the two groups' global self-worth (self-concept) was only significant at a $p < 0,1$ level.

3.3.2.3 Social Adjustment, Aspirations, Expectations and Self-Evaluation

Magill-Evans and Restall (1991) investigated the self-concept and social adjustment of adolescents with cerebral palsy over a period of seven years. They found a significant increase in self-concept scores from adolescents with cerebral palsy to adults with cerebral palsy. No significant differences between the self-concept of disabled and non-disabled groups were found.

A study conducted by Arnold and Chapman (1992) investigated the self-concept, aspirations and expectations of disabled adolescents. The results of the study revealed no over-all significant difference between the self-concept scores, expectations and aspirations of the disabled and able bodied groups.

King et al. (1993) investigated the differences between the self-evaluations and self-concepts of adolescents with physical disabilities and their correlations with normative data. No differences were found in the self-evaluations of male and female adolescents with cerebral palsy, spina bifida, and cleft lip or palate or both in comparison with normative data attained from able bodied persons. There were significant differences in several aspects of the self-concept. Disabled adolescents showed a lower perceived athletic competence, romantic appeal, scholastic competence (only males) and social acceptance (only females).

3.3.3 Conclusion

One's body-parts and the connotations they assume are an important part of one's sense of self-worth. It is thus reasonable to suppose that defects in physical development are likely to have detrimental effects upon the self-concept of individuals with congenital defects (Harvey and Greenway, 1984).

In a review of relevant literature, La Greca (1990) concludes that the most noticeable conclusion that can be drawn from the results of studies of this nature is that the above mentioned statement is far from the truth. She states that children with chronic illness and disabilities, and their families, do not differ substantially from healthy youngsters in terms of disease specific personality patterns or prevalence of severe emotional disorders. There is little empirical evidence that members of any stigmatised group have low global self-esteem (Crocker and Major, in King et al., 1993).

Childhood disability and illness should be viewed as a stressor that, depending on its interaction with a variety of other variables will have a varying effect on the child or adolescents' self-esteem and self-concept (Drotar, in King et al., 1993).

3.4 THE RELATIONSHIP BETWEEN LOCUS OF CONTROL ORIENTATION AND SELF-CONCEPT

An important component of low self-concept is the view of one's self as ineffectual, powerless, and impotent regarding the achievement of personal goals. In order to avoid anticipated blows to a fragile self-concept, it is likely that a person with a low self-concept will "externalise" responsibility for his actions and attribute the consequences of his behaviour to factors beyond his control. On the other hand a person with a high self-concept is likely to view himself as determining the outcome of his behaviour (Epstein and Komorita, 1971).

Several authors have found a positive relationship between self-concept and externality in school aged children. Thus a higher external orientation tends to be correlated to a negative self-concept (Chadha, 1989; Epstein and Komorita, 1971; Henderson, Kelbey and Engebretson, 1992; Madonna, Bailey and Wesley, 1990; Moyal, 1977; Ralph et al., 1995; Yong, 1992) The results of the above mentioned studies are summarised in Table 3.3.

The authors mentioned below investigated the relationship between several other factors and locus of control orientation and self-concept. These factors can be categorised in three categories namely social factors, personality factors and biographical factors.

Table 3.3:

Studies investigating the relationship between locus of control orientation and self-concept

Study	Sample	Age	Measuring Instrument	p
Epstein & Komorita (1971)	Able Bodied African American	10-13 years N=120	Coopersmith Self-Esteem Inventory Locus of Control Scale for Success- Failure	p<0,1
Moyal (1977)	Able Bodied (Canada)	5the Grade N=225	Piers-Harris Self-Concept Scale Nowicki-Strickland Locus of Control Scale	p<0,01
Chadha (1989)	Able Bodied (India)	12th Grade N=307	Chadha Self-Concept Scale Rotter Internal-External Scale	p<0,01
Madonna, Bailey, Wesley (1990)	Able Bodied (USA)	9-11years N=107	Piers-Harris Self-Concept Scale Nowicki-Strickland Locus of Control Scale	p<0,01
Yong (1992)	Gifted African-Mexican-Chinese-Americans	14-16 years N=169	A Self-Concept Scale for Gifted children Nowicki-Strickland Locus of Control Scale	p<0,001
Henderson Kelbey, & Engebretson (1992)	Able Bodied (USA)	3rd grade N=65	Piers-Harris Self-Concept Scale Intellectual Achievement Responsibility Questionnaire	p<0,01
Ralph, Merralls, Porter, Su-Neo, Hart (1995)	Able Bodied Australia	12-13 years N=328	Piers-Harris Self-Concept Scale Nowicki-Strickland Locus of Control Scale	p<0,01

3.4.1 Social Factors

The social factors discussed in this section are: children's' family background and relations, and classroom environment.

Chadha (1989) investigated a structural model which links family and personality background variables, self-concept and locus of control, and academic achievement. Subjects who perceived their family relations to be satisfactory, showed higher levels of self-concept ($p<0,01$). Locus of control orientation was not significantly related to satisfactory family relations.

Madonna, Bailey and Wesley (1990) examined classroom environment and locus of control in identifying successfully children showing high and low self-concepts. Children identified as having high self-concept scored higher on the need for order and organisation, and affiliation and scored lower on innovation. They tended to be more internal in their locus of control orientation than children identified as low in self-concept.

3.4.2 Personality Factors

The personality factors that will be discussed in this section are: childrens' experience of success and failure, depressive symptoms, creativity, stress control and coping behaviour.

Epstein and Komorita (1971) found that a person's experience of failure is attributed to external causes more often than an experience of success is. They did not, however, find a significant interaction between success-failure experience and self-esteem. The attribution of failure to external factors may enable an aggrieved class of people, like minority groups in society, to maintain a capacity for psychological resilience and survival in the short-term. It will, however, constitute a self-defeating mechanism for long-term social adjustment.

Low self-esteem, external locus of control and stimulus appraisal are related to depression in adults. Moyal (1977) investigated the relationship between these variables in Grade 5 and 6 children. External locus of control scores correlate

negatively with self-concept scores, and positively with depression scores. The results of this study indicates that externality tends to be related to a low self-concept and depressive feelings. These findings support the theory that a feeling of helplessness to change a situation is an important element of depression, even in children.

Chadha (1989) investigated the correlation between subjects' creativity and their self-concept and locus of control orientation. Creativity was measured by the Torrance Test of Creative Thinking and was significantly related to high self-concept and internal locus of control orientation.

The effects of a stress-control programme on childrens' self-concept, locus of control and coping behaviour was investigated by Henderson, Kelbey, and Engebretson (1992). The study consisted of a experimental group who participated in a four week stress control programme and a non-participating control group. The experimental group scored significantly higher in the posttest of the Stress and Coping Questionnaire (Dickey & Henderson, 1989), and the posttest of the locus of control scale (Intellectual Achievement Responsibility Questionnaire, Crandall 1992).

3.4.3 Biographical Factors

The biographical factors discussed in this section are gender, socio-economic status (SES), and age.

Chadha (1989) found that 12th grade female subjects are significantly more internally orientated concerning locus of control. Males tend to have a higher self-concept score than females. However this difference was not statistically significant. The results of a study by Ralph et al. (1995) supports Chadha's (1989) findings. Ralph et al. (1995) also found that female subjects are significantly more

internally orientated ($p < 0,05$). These findings are, however, contrary to the results of a study conducted by Cellini and Kantorowski (1982).

The results of a study by Chadha (1989) in India, showed that socio-economic status does not correlate significantly with either self-concept, locus of control, creativity, family relations or academic achievement. Results of a study conducted by Ralph et al. (1995) show significantly lower externality for higher socio-economic status subjects. There appears to be no difference between the locus of control scores for the medium and lower socio-economic status subjects. The results of this study show no significant relationship between self-concept scores for the different socio-economic status subjects. These findings contradict the findings of Long and Henderson (quoted in Ralph et al., 1995) who reported that children of low SES reflect the negative image society holds of them and have significantly lower self-concepts.

Several studies report that locus of control orientation become more internal with age (Nowicki and Duke, 1974; Nowicki and Strickland, 1973). Yong (1992) reports no significant differences related to self-concept and locus of control orientation for gifted children of different ages.

3.4.4 South African Studies

A study by Mukheibir (1994) evaluated the sex-role identity, locus of control and self-concept of adolescent South African females (ages 15 - 17). The group as a whole does not significantly show any single sex-role orientation. A significant relationship ($p < 0,05$) between self-concept and locus of control emerged. Subjects with a high self-concept tended to be internally orientated and vice versa.

De Lange (1988) investigated and analysed the symptomatology of the cerebral palsied child at a physical and psychological level. The results of this study included recommendations for a therapeutic programme.

De Lange (1988) stated that the most important goal is to help the cerebral palsied child overcome his tendency to passivity. Several "needs" may be satisfied in this way. The findings of this study suggest that the abovementioned be achieved by:

a) Play
- satisfies the need to develop various interests
- need to form healthy social contacts
- overcomes passivity

b) Success
- develops motivation and interest
- confidence to persist and develop a skill

c) Creativity
- overcomes passivity and asserts himself
- stimulates interests
- provides sense of satisfaction

d) Develop Opportunities for Normal Experiences
- teaches child "normal experiences" and vocabulary
- overcome depression
- learns what is expected

e) Individualisation
- Children need to be individualised - not grouped.

f) Self-acceptance
- Crucial to development of individual's adjustment

The subjects participating in this study consisted of 15 cerebral palsied boys and girls attending a special school for cerebral palsied children. The subjects' ages ranged from 12 to 19 years. The following tests were administered: Senior South African Individual Scale, Cape Vocational Interest Questionaire, High School Personality Questionaire, Thematic Apperception Test, The Draw-a-Person test, The Bender Visual Motor Gestalt Test.

3.4.5 Conclusion

Social scientists have shown an increasing recognition of the significant implications of the "internal-external" control construct for psychological adaptation (Epstein and Komorita, 1971). Children with a high self-concept tend to be internally controlled, whereas children low in self-concept tend to be externally controlled (Madonna, Bailey and Wesley, 1990).

The results of the studies discussed in this section indicate the following:

- Children with a high self-concept tend to have a greater need for order, organisation and affiliation and tend to be more internally orientated (Madonna, Bailey and Wesley, 1990).
- The experience of failure rather than success, is attributed to external causes (Epstein and Komorita, 1971).
- Externality tends to correlate positively with depression in children (Moyal, 1977)
- High self-concept and internal locus of control orientation tend to correlate with childrens' creativity (Chadha, 1989).
- Ageing leads to an intensification of internal orientation (Nowicki and Duke, 1974; Nowicki and Strickland, 1973).

CHAPTER 4

RIDING THERAPY IN SOUTH AFRICA - A PROGRAMME EVALUATION

4.1 RIDING THERAPY IN SOUTH AFRICA

In South Africa riding therapy is co-ordinated by the South African Riding for Disabled Association (SARDA) which originated in Cape Town in 1975. SARDA is affiliated to the international Riding for the Disabled Association. Branches have been established in Cape Town, Port Elizabeth, Durban, Pietermaritzburg, Johannesburg and Bloemfontein.

Riding therapy as implemented by SARDA, is neither hippotherapy nor vaulting and riding, but a form of physical education with psychosocial benefits and is schematically represented in Figure 4.1 (Wood, 1990). SARDA's aim is to teach disabled children and adults to ride as competently as possible. The emphasis of riding therapy in South Africa is placed on overcoming disabilities, improving daily living and providing recreation.

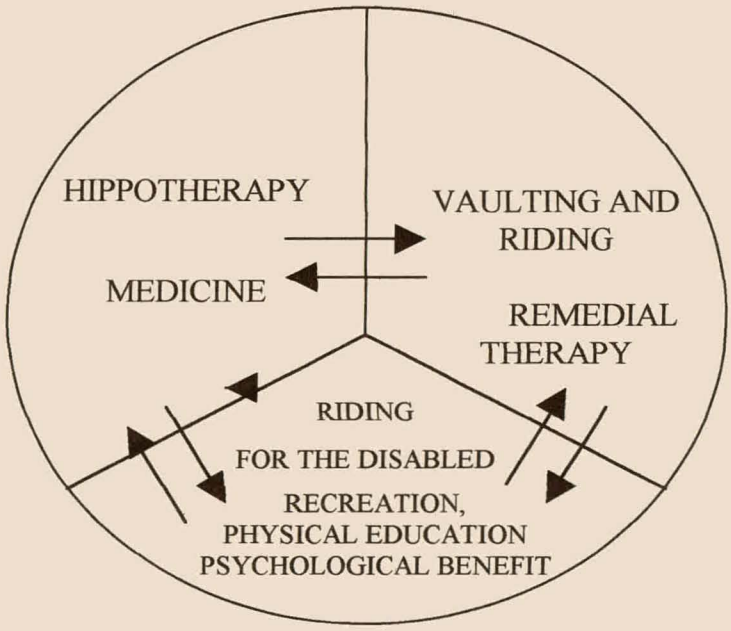


Figure 4.1: Three areas of therapeutic riding (Wood, 1990)

4.1.1 The Structure of SARDA

The participants of Riding for the Disabled are divided into two main categories: enablers and riders. There are three types of enablers that are essential to the riding therapy programme: horses, helpers, and riding instructors.

4.1.1.1 Horses and Ponies

There is no specified breed of horse which is used for riding therapy. Horses and ponies, however are carefully screened in terms of temperament. Horses and ponies used for disabled riders should be trustworthy and have quiet and steady temperaments (Haskin et al, 1974). The size of horse relates to the size of the person it will carry. A pony is more suitable for a small child. Larger animals might be suitable for adult riders, but pose problems for small helpers who have to support severely disabled riders (Wood, 1990).

4.1.1.2 Helpers

The role of the helper is to assist the disabled rider by leading the horse or pony, or by supporting the rider on the horse. SARDA makes use of volunteer helpers from all walks of life. Many of these often have no prior knowledge of horses or the disabled, but want to contribute to the needs of the community. Helpers soon acquire skills in handling horses, adjusting stirrups and correcting the seat of the rider. Helpers need to have compassion for, and patience with, both horses and disabled riders.

The helper who leads the horse or pony has to ensure that the animal is under control at all times. The horse has to be maneuvered into the mounting block, through gates and around obstacles. It is the leader's responsibility to see to it that the rider is safe during these maneuvers. The side helper walks at the side of the horse with one hand on the disabled person's leg. This helper's role is to stabilize the rider and to ensure that the rider stays in the saddle in the correct position. Severely disabled riders often

need a side helper. Many riders who start riding therapy with a side helper will lose the need for one as their muscles strengthen.

Continuity is provided by ensuring riders ride the same horses and are aided by the same helpers at every weekly session where possible. Close relationships are formed between helpers and riders, and helpers and horses.

4.1.1.3 Riding Instructors

According to Haskin et al (1974) the riding instructor must be mature and thoroughly experienced in equitation (horsemanship). The constitution of SARDA stipulates that a qualified riding instructor, whose qualifications are internationally recognized, must provide riding instruction. Instruction can also be provided by "branch" instructors who trained at various local branches of SARDA in South Africa. These branch instructors undergo written and practical examinations (Wood, 1990). The practical examination includes riding ability, horse assessment, and the teaching of disabled as well as non-disabled riders. The written curriculum includes stable management, first aid and a knowledge of physical and mental disability.

The instructor must know the disabled rider's physical and mental limitations and abilities. Risk exercises prove exhilaration of the spirit (Haskin et al, 1974).

4.1.1.4 Riders

SARDA provides therapy to cerebral palsied, autistic, deaf and mentally and physically disabled children. Any disabled child, despite race, creed or disability, who on the recommendation of a medical advisor, will benefit either mentally or physically from horse riding, is qualified to enroll (Fiat Lux, 1987).

4.1.2 The Structure of the Riding Therapy Programme

Riding therapy as presented by SARDA includes recommended exercises on horseback, games, and outrides. Therapists, helpers and riding instructors work as a team to help disabled riders. The objective is to promote a feeling of achievement at all times, even if progress is minimal.

4.1.2.1 Mounting

A riding therapy session commences with the mounting procedure. Riders mount their horses at a mounting block with the help of their helpers and an instructor. The mounting block is an elevated wooden structure with a ramp. It is accessible to riders with walking aids and wheelchairs. The horse is placed in an enclosed corridor with the helper standing in front of it. The rider is helped onto the horse's back by the instructor. When the rider is secure in the saddle the helper leads the horse to the file of other horses and riders who participate in the session.

4.1.2.2 The Riding Session

The riding session starts when all riders are mounted and their stirrups and girths are inspected. It is essential for the rider's position and safety that the stirrups are the correct length. The session takes place in a 60 by 20 meter enclosed arena. Horses walk behind each other with a horse's distance between them. The instructor stands in the center of the arena with a clear view of all riders.

The helper's task is precisely as the name suggests - to help or assist. Riders ride and control their own horses to the best of their ability. The first part of the riding therapy session consists of exercises. These are designed to warm up and strengthen the rider's muscles and to give the rider confidence. Exercises promote balance, co-ordination, strength, posture and rhythm and are done at a standstill, at a walk, and

the experienced riders at a trot (Haskin et al, 1974). Figure 4.2 illustrates three different exercises commonly used in riding therapy. Drawing (a.) illustrates an exercise where the rider is asked to clap or lift his hands above his head while retaining the correct riding position with the rest of his body. Drawings (b.) and (c.) illustrate two exercises where the rider is asked to hold on to the saddle with one hand and attempt to touch his horse's tail and ears with the other hand. This initiates a swinging movement with the upper body, while the lower body stays in the correct riding position.

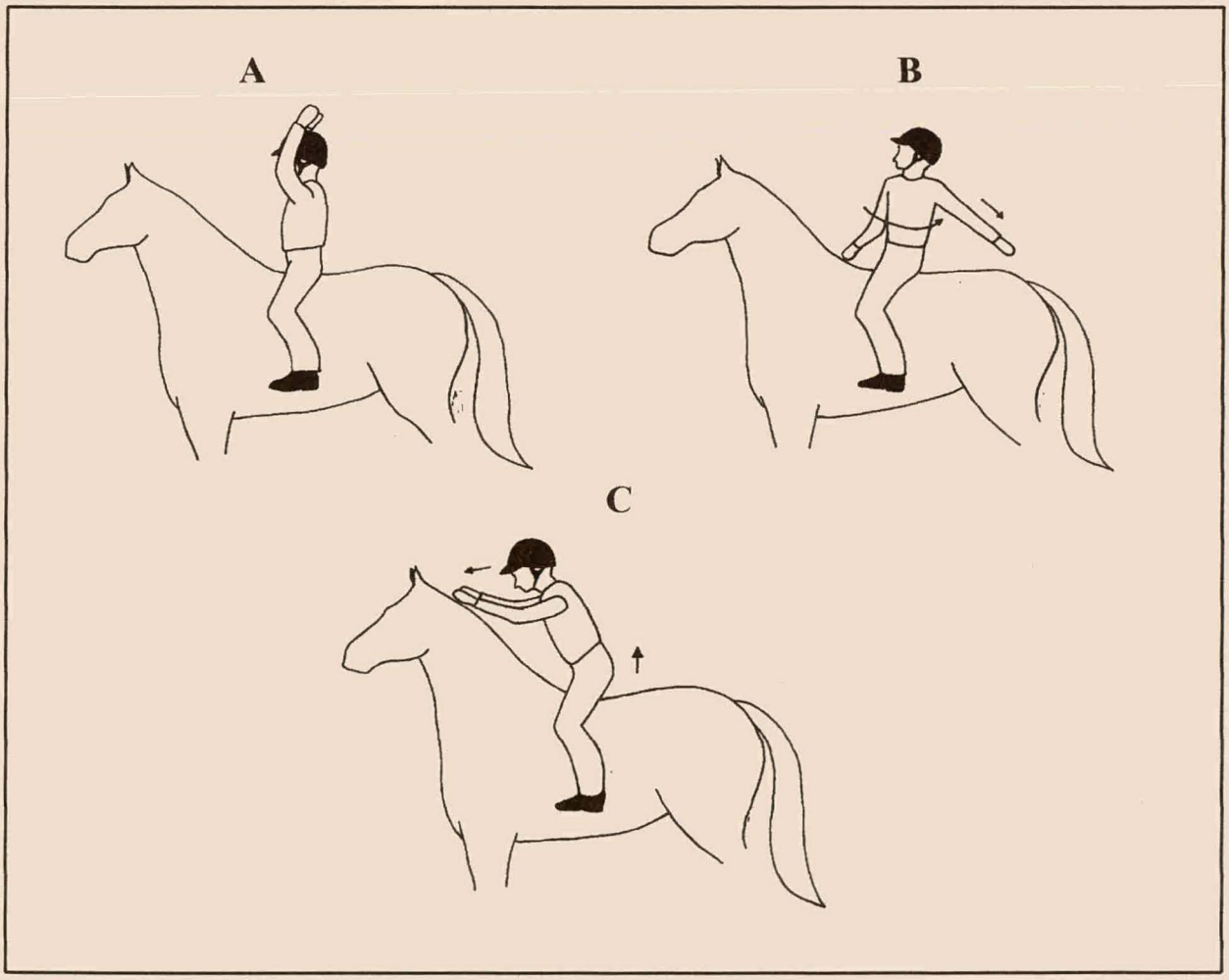


Figure 4.2 Exercises commonly used in riding therapy.

After completing exercises, the riders often compete in games or races. Bean bags and other apparatus are used in these games. An example of a game is bending poles.

The rider is asked to steer or weave his horse through barrels placed on a straight line. This can be done individually or as a race.

Trotting is also an important exercise. The trot is the horse's most uncomfortable and difficult pace. The rider must sit and rise to the rhythm of the horse's feet. This is a difficult task for the normal beginner rider and thus an extremely difficult one for the disabled. The side helper often helps lifting the rider out of his seat.

The rider will practice transitions in pace right through the session. Riders (not helpers) have the responsibility to make their horses walk, trot, turn, and halt whenever it is required. They are placed in control of their horse's speed and direction and helpers will only intervene if necessary.

4.1.2.3 Dismounting

Riders dismount at the mounting blocks or with the assistance of their helper. Each rider is required to lead his horse to its stable and to untack. In this way the riders learn aspects of basic stable management.

4.2 TEACHING THE DISABLED TO RIDE

Learning to ride is a step-wise process. A normal rider will first learn to mount and dismount, then walk, then trot, then canter and only then more advanced techniques and procedures. Each procedure requires the development of different skills. There are, however, basic riding skills that apply in general to horse riding. These skills involve the rider's seat and the riding aids. The seat can be described as the correct position of the rider's whole body while mounted on the horse. The riding aids are the specific messages that the rider must give to the horse in order for it to halt, change direction and change its speed and pace. Most cerebral palsied riders have great difficulty to retain the correct seat and to give the correct aids because of

increased or decreased muscular tone and spasticity. Cerebral palsied riders often sit behind the vertical (Figure 4.3 A) or in front of the vertical (figure 4.3 B) as opposed to the correct sitting position (Figure 4.3 C). In spite of these difficulties, riders are encouraged to retain a correct seat.

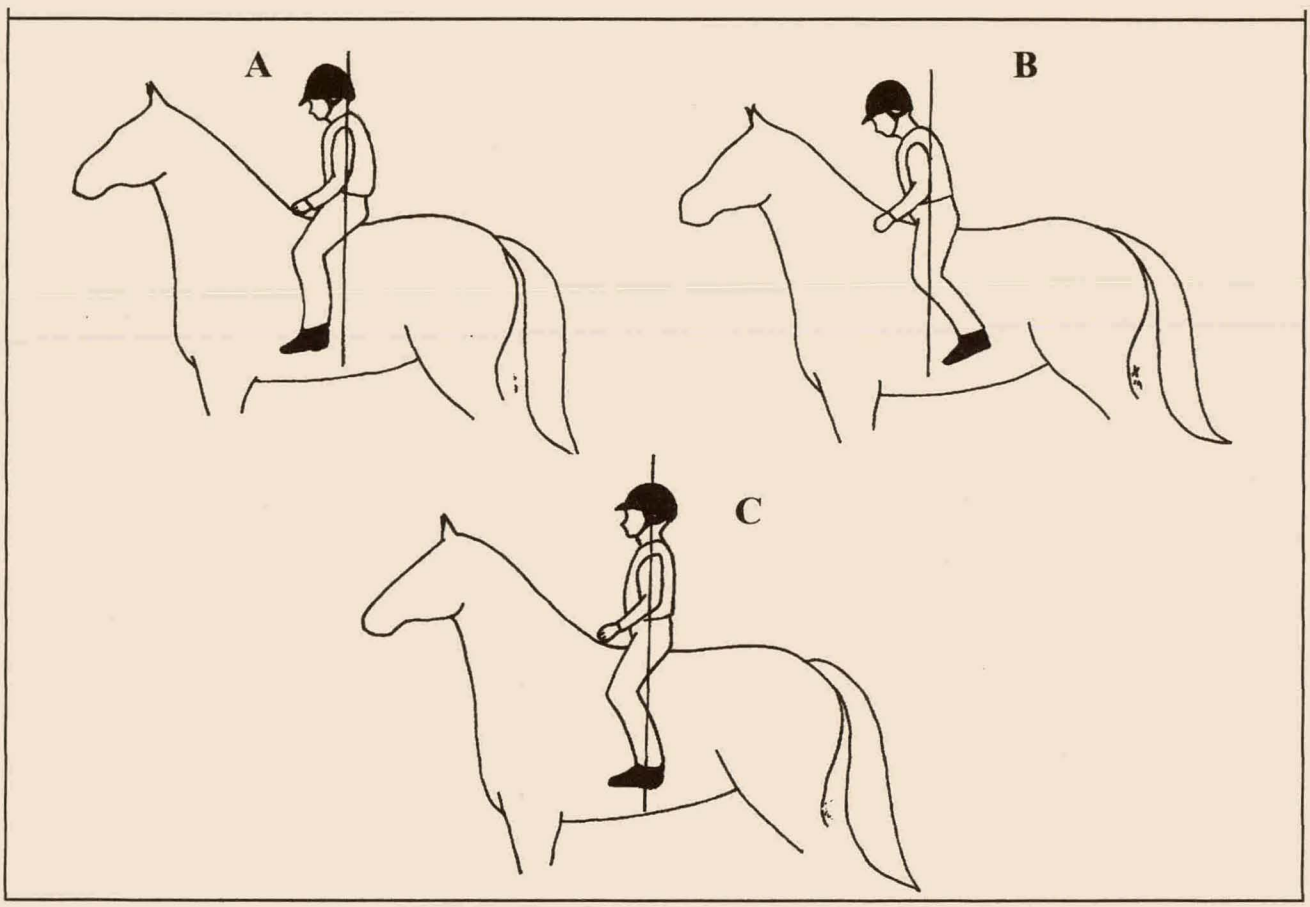


Figure 4.3: Common postural problems of disabled riders with drawing C showing the correct posture.

Basic riding skills are practiced at every session and new procedures are taught at the discretion of the instructor. If the instructor feels that the rider is secure in the saddle at the walk, the rider will be taught to trot with the help of the helpers. If the instructor feels that the rider is fully in control of his horse and secure in the saddle at the trot, the rider can proceed to trotting without the help of the helper.

Games and races are a good way of teaching the riders to control their horses. The satisfaction of winning a race increases the rider's confidence in himself and his horse and leads to the enjoyment of the riding session. From time to time sessions are substituted for out rides. Helpers, riders and instructors follow a planned route in the surrounding countryside. Riders are constantly watched by instructors and helpers and must ride correctly as taught in the riding sessions

Certain riders may progress to independent riding, where the leader loops the leading rein around the horse's neck and the helpers (if any) release their hold on the rider. The rider is then in sole control of the horse. Riding therapy teaches the disabled child "how to do" something - not how it should be done (Haskin, et al. 1974).

Photosheet 1 depicts scenes from a riding therapy session:

Photo 1 shows participants with helpers going on an out ride. Note that most riders have a leader and a helper assisting them, because riding out is far more dangerous than lessons in the school.

Photo 2 shows a rider with her helper and leader in the arena where lessons are conducted.

Photo 3 shows a rider and pony at the trot. Note that the rider's balance is behind the vertical as depicted in Figure 4.3 A.

Photo 4 shows a rider mounting a pony with assistance from the instructors and helpers. This is done from a ramp.

Photo 5 shows the group of participants lined up before the start of the riding therapy session. The stirrup lengths and girths of all riders are inspected at this point.

Photosheet 1

Photo 1

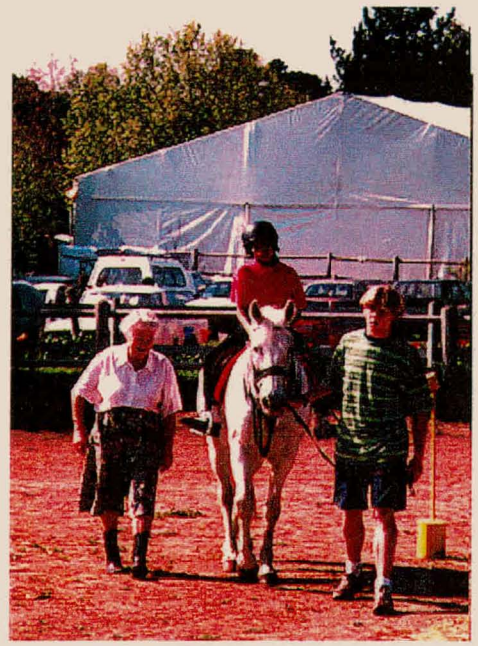


Photo 2

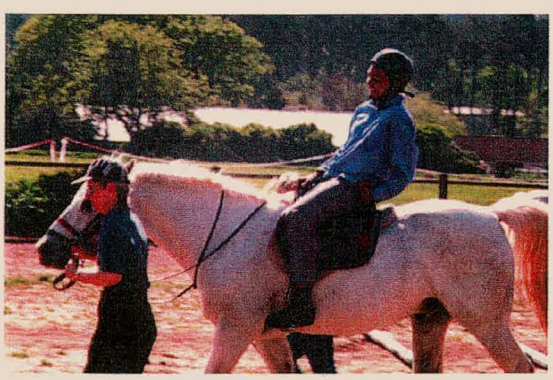


Photo 3

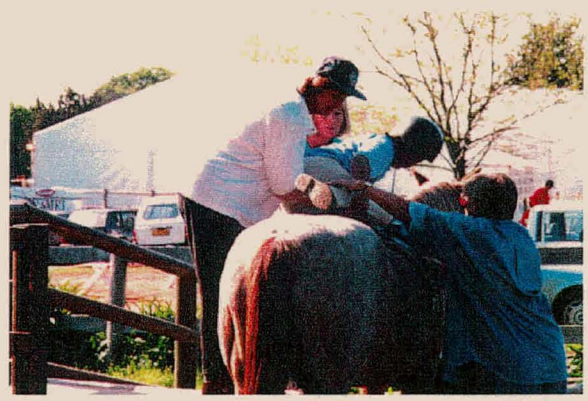


Photo 4

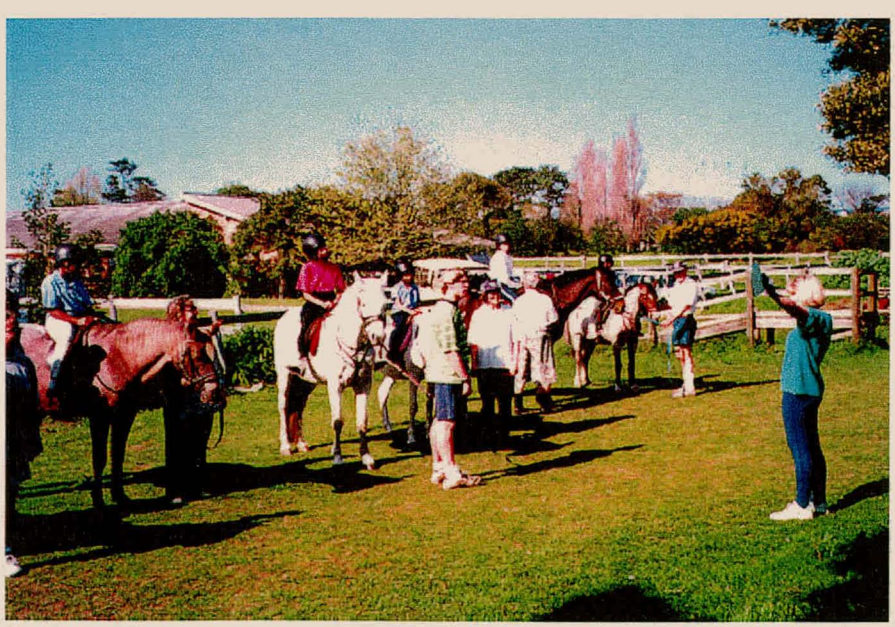


Photo 5

4.3 THE CHARACTERISTICS OF SARDA'S RIDING THERAPY PROGRAM

1. The programme is based on universal guidelines and procedures pertaining to riding instruction. SARDA does not teach a special form of horse riding to disabled persons. The standard English style of riding is taught. This style is the most commonly used of all riding styles and is used by riders internationally in various disciplines of riding.

2. The programme is based on a comprehensive model with a conceptual framework that includes input from physiotherapists, educational officials and specialists in the field of riding therapy.

3. The effectiveness of the programme is based on the fact that it is implemented by skilled instructors. Only qualified instructors are allowed to conduct riding therapy sessions at SARDA riding centers.

4. The nature of the programme is pliant. Although the learning process is step-wise, instructors have the freedom to concentrate on different aspects of riding as they see fit. This process is closely linked to the needs of the rider.

The essence of this programme lies in the fact that the disabled rider, while learning to ride is placed in a positive environment which aims to rehabilitate, provide physical and psychological benefits and provide a form of recreation.

CHAPTER 5

RESEARCH PROBLEMS AND HYPOTHESES

5.1 MAIN AIM OF THE STUDY

The aim of this study is to establish whether riding therapy can be promoted as a successful and useful therapy for physically disabled children, specifically cerebral palsied children. This is the first study of this nature to be conducted in South Africa and is therefore exploratory in nature.

In view of the above mentioned aim of the present study and based on the literature overview presented in Chapter 3, the following research questions were formulated.

5.2 THE RESEARCH QUESTIONS POSED BY THE STUDY

Is there an improvement in the:

a) physical aspects of the child and/or has the child mastered new skills - this will be determined by means of the Rider Classification Scale, The Parents' Questionnaire and the written comments from helpers?;

b) psychological functioning of the child, specifically the self-concept and locus of control orientation of the child as determined by the Piers-Harris Children's Self-Concept Scale and the Nowicki-Stricland Pre-Primary Locus of Control Scale, as well as The Parents' Questionnaire and the written comments from helpers?.

CHAPTER 6

METHOD OF RESEARCH

This chapter describes the methodology followed in the present study. The sampling, measuring instruments, scales which were developed for this particular study, the procedures which were followed as well as the statistical techniques that were used to analyse the data are discussed.

6.1 SAMPLING

The subjects who participated in this study were divided into a experimental group and a control group. The experimental group consisted of 13 physically disabled children, 4 boys and 9 girls. Twelve Subjects were cerebral palsied (1 quadriplegic, 5 di-plegic, 5 hemiplegic, 1 triplegic) and one subject suffers from degenerative ataxia.

The subjects in the control group were individually paired to subjects in the experimental group with regard to age, gender and type of disability. The pairing procedure was conducted by one of the physiotherapists at the school. The subjects' intellectual functioning was also considered in the pairing process in that paired subjects attend the same school grade whether it be academical or technical classes. The control group was bound to the following exclusion criteria: riding instruction during the past two years and participation in a similar sport on a regular basis.

The subjects' ages range from 7 to 14. The average age of the subjects was 10,38 years. All subjects attended a school for cerebral palsied children and all subjects received physiotherapy on a regular basis. The school caters for physically disabled

children and not mentally disabled children. All subjects are considered educable as they attend regular or technical classes at school.

6.2 MEASURING INSTRUMENTS

6.2.1 Piers-Harris Children's Self-Concept Scale (Piers, 1984)

6.2.1.1 Motivation for use of the Piers-Harris Children's Self-Concept Scale

The Piers-Harris Children's Self-Concept Scale Measures more than self-esteem, which is seen as an aspect of self-concept. It is a multi-dimentional instrument which includes "adjustment" as well as self-esteem items such as "anxiety" and "happiness" (Fleming and Courtney, 1984).

Piers and Harris is of the opinion that self-esteem is simply a total of all the parts of self-concept, with all parts being equally weighted. This unitary approach has been used in most studies reported in literature involving children with disabilities (Mayberry, 1989).

6.2.1.2 General Description and Administration

The Piers-Harris Children's Self-Concept Scale (PH-CSCS) is a questionnaire designed to assess how children and adolescents feel about themselves (Piers, 1984). It is intended for use with children as well as adolescents, aged eight to eighteen years. Several studies indicate that the questionnaire can be administered successfully to children aged six and seven (Aston, 1975; Brown, 1970; and Wilson, 1973, quoted in Piers, 1984).

The PH-CSCS consists of 80 items with a "yes" or "no" answer and provides six cluster scales: Behaviour, Intellectual and School Status, Physical Appearance and Attributes, Anxiety, Popularity, and Happiness and Satisfaction. The scale evaluates both general and specific dimensions of self-concept (Piers, 1984). A response bias index and an inconsistency index is available.

The questionnaire can be administered on an individual or group basis and the questions may be read to subjects, if needed. Administration time is approximately twenty minutes per person. The Afrikaans translation was obtained from a study by Greeff (1988). This questionnaire has been successfully administered to learning disabled students (Zemke et al., 1984; Cawley et al., 1994), and mentally retarded children (Eldridge, Witmer, Barakowski, & Bauer, 1977, quoted in Piers, 1984).

6.2.1.3 Validity and reliability of the Piers-Harris Children's Self-Concept Scale

Sabers and Whitney (quoted in Franklin Jr, Dudley, Rousseau and Saberes, 1981) provided a model for extensive empirical construct validation of an instrument. They examined four basic categories of evidence: convergent validity, discriminant validity, internal consistency, and the sensitivity of the measure to change.

According to Robinson, Shaver en Wrightsman (1991) the correlation coefficient between the PH-CSCS and the Tennessee Self-Concept Scale (TSCS) is 0,51 for males and 0,61 for females. The PH-CSCS correlates highly ($r = 0,85$) with the Coopersmith Self-Esteem Inventory. Franklin Jr. et al. (1981) found a correlation coefficient of 0,78 ($p < 0,01$) between the PH-CSCS and TSCS scores of 569 children between the ages of 10 and 13. They found that the PH-CSCS has discriminant validity with respect to socio-economic status, special education placement, ethnicity, grade placement, gender and age.

According to Piers (1984), the PH-CSCS's reliability coefficients (Alpha, Spearman-Brown, and Kuder-Richardson) from nine samples ranged from 0,88 to 0,92.

Franklin Jr. et al. (1981) found an internal consistency coefficient equal to 0,92 ($p < 0,01$).

According to Piers (1984) the PH-CSCS's test-retest reliability ranged from 0,80 to 0,96 for a 4-week period. Wolf, Sklov, Hunter, Webber, and Berenson (1982) found a test-retest reliability of 0,90 for six weeks.

The Piers-Harris Children's Self-Concept Scale appears to comply with Sabers and Whitney's (quoted in Franklin Jr, et al. 1981) model for extensive empirical construct validation of an instrument.

6.2.2 The Pre-school and Primary Nowicki-Strickland Locus of Control Scale (PPNS), (Nowicki and Duke, 1974)

6.2.2.1 Motivation for using the Pre-school and Primary Nowicki-Strickland Locus of Control Scale

Nowicki and Duke (1974) felt that there was a need for a locus of control scale for children below 3rd grade level. At that time, there were only 2 such tests, one had to be individually administered and neither had satisfactory comparable forms for older subjects. For this reason the Pre- and Primary School shortened version of the Nowicki-Strickland Locus of Control Scale was administered in this study.

The Pre- and Primary School Nowicki-Strickland Locus of Control Scale (PPNS) is a shortened version of the original Nowicki-Strickland Locus of Control Scale and was developed for use with children from the age of five. MacDonald (in Nowicki and Duce, 1974) states that the original Nowicki-Strickland Locus of Control Scale for Children appears to be the best measure of locus of control as a generalised expectancy presently available for children. This shortened version was designed to be comparable to the other forms of the Nowicki-Strickland Locus of Control Scale.

Four versions of the original Nowicki-Strickland Locus of Control Scale for Children (NS-LCSC) are available:

a) The Pre- and Primary School Abbreviated Nowicki-Strickland Locus of Control Scale,

b) the High School Nowicki-Strickland Locus of Control Abbreviated Scale,

c) the original 40 item Nowicki-Strickland Locus of Control Scale (ages 8 to 18),

d) the Adult Nowicki-Strickland Locus of Control Scale (Nowicki and Strickland, 1973).

6.2.2.2 General Description and Administration

The PPNS is a questionnaire designed to measure whether or not a child believes that reinforcement comes to him or her by chance or fate (external locus of control) or because of his or her own behaviour (internal locus of control), (Nowicki and Duke, 1974). The 26 item scale has a "Yes" or "No" format and was designed for pre- and primary school aged children, five to eight years old. Mean scores are available for 5 and 6 year olds and 7 and 8 year olds, and are 12,31 and 11,45 respectively (Nowicki and Duke, 1974). Locus of control tends to become more internal with age. Higher scores reflect a greater external locus of control (Fischer and Corcoran, 1987).

This version of the Nowicki Strickland Locus of Control Scale for children was chosen for this study because the items are clear and simple to understand. The normal 40 item Nowicki-Strickland Locus of Control Scale for children was thought to be too complicated for the younger children who participated in this study. The Pre- and Primary School version was the obvious choice in this case as the items are easily understandable and not complex at all (Nowicki and Duke, 1974).

6.2.2.3 Construct validity and reliability of the Pre-school and Primary Nowicki-Strickland Locus of Control Scale

The results of a study by Nowicki and Duke (1974) suggest that the PPNS meets the minimal requirements of construct validity. They found a 0,78 ($p < 0,001$) correlation between the original 40 item version of the NS-LCSC and the PPNS. Item correlations of the PPNS ranged from 0,3 to 0,7. These results suggest optimal conditions for discrimination. The PPNS shows a high test-retest reliability of 0,79 ($p < 0,001$) for a six week period. The scale has inherently the same pattern of psychometric properties as its comparable forms for older subjects.

6.2.3 The Parents' Questionnaire

The Parents' Questionnaire (Addendum 1) was designed for this study to provide a qualitative insight of the physical and psycho-social changes which parents have noticed in their children since they commenced with riding therapy. The questionnaire consists of 16 questions for which a "yes" or "no" answer must be produced.

The questions are based on results obtained from various studies concerning the physical and psychological benefits of riding therapy (Wood, 1990; MacKinnon et al., 1994; Wingate, 1982; Haskin et al., 1974). These studies include the views of riding therapy instructors and parents of disabled children who participated in riding therapy on the changes that might have occurred since the subjects commenced with riding therapy. The changes that were noted can be divided into three groups: physical changes, changes in every day functioning, and psycho-social changes.

The items of the parents' questionnaire were based on the three abovementioned groups. Physical changes were investigated in terms of balance, suppleness, muscle power, posture, muscle control, gait, and pain. Changes in functioning were investigated in terms of life tasks and mobility. Psycho-social changes were

investigated in terms of the enjoyment experienced because of horse riding, anxiety, new activities, perceived self-concept, relationships with brothers and sisters, and aggression. In addition to the questionnaire, parents had the opportunity to comment on any other changes they have noticed since their children started horse riding.

Certain limitations exist pertaining to the nature of this questionnaire. The results produced by this questionnaire will portray the subjective views of the subjects' parents. Several of these parents are illiterate or semi-literate and interpretation of questions may be inconsequent. The results of the Parents Questionnaire will therefore be regarded as supplementary to the primary research design.

6.2.4 The Rider Classification Scale

The Rider Classification Scale (RCS) (Addendum 1) was adapted from the Developmental Riding Therapy Client Classification Scale (Spink, 1993). It was adapted specifically for the present study to assess the riding progress of disabled riders who are participating in riding therapy. This scale quantifies an individual disabled rider's riding ability. The minimum score that can be obtained is 3. This indicates that the rider needs total assistance, has minimum task control, is maladaptive and non-compliant, has poor upper and lower extremity control and has a poor sense of balance on the horse. A maximum score of 15 can be obtained. This indicates minimum assistance for a disabled rider, good task control, compliant and co-operative behaviour, consistently good upper and lower extremity control as well as good balance on the horse. The higher the score obtained, the higher the level of horsemanship achieved by the disabled rider within the limits of the therapeutic riding programme. The scale consists of five items: assistance level, task control, behaviour, posture and balance. The rider can obtain a score of 1,2 or 3 depending on his or her capabilities. The scale was scored while the subjects were actively participating in riding therapy.

The use of this scale is limited for a number of reasons. This scale is specifically formulated for disabled riders, not for able bodied riders. The contents of this scale has direct relevance on the SARDA Riding Therapy Programme and it would thus not be ideal for use in other programmes that might differ in content.

6.3 PROCEDURE

6.3.1 Research Design

The study took the form of a quasi-experimental non-equivalent control group design. The effects of riding therapy on the self-concept and locus of control orientation of physically disabled children were investigated by the following measures:

(1) The self-concept of both groups was evaluated by the Piers-Harris Children's Self-concept Scale (PH-CSCS) before the experimental group commenced riding therapy. After the experimental group has participated in riding therapy for twelve weeks (twelve sessions) the evaluation was repeated. The period of twelve weeks were selected as it is the average time period that were selected by other authors (Bertoti, 1988 - 10 weeks; Carlson, 1983 - 10 weeks; Cawley et al., 1994 - 8 weeks; MacKinnon et al., 1994 - 26 weeks; Wingate, 1982 - 10 weeks)

(2) The locus of control orientation of both groups was evaluated by the Pre-school and Primary Nowicki-Strickland Locus of Scale for Children (PPNS) before the experimental group commenced riding therapy and after the experimental group participated in riding therapy for ten weeks.

(3) The parents of the experimental group were asked to complete an informal questionnaire, consisting of questions relating to psycho-social and physical changes that might have occurred in children since they started with riding therapy.

(4) The subjects' riding progress was assessed by the Rider's Classification Scale when starting riding therapy and was repeated after ten weeks of participation.

(5) The subject's physical progress was ascertained by means of written comments from their individual helpers, who assisted them during the riding therapy sessions.

6.3.2 Application of Experimental Procedures and Administration of Tests

The subjects in the experimental group received riding therapy on a two weekly basis since January 1997 at a local branch of a SARDA (South African Riding for the Disabled Association) Riding School. The group was divided into two groups who alternated riding therapy sessions every week. A riding therapy session lasted approximately 40 minutes. Where possible the subjects rode the same horses every week and had the same helpers every week.

(a) Pre-test Data Collection

The pre-test data collection took place in January of 1997. Both the experimental group and the control group completed the PH-CSCS and the PPNS. The experimental group started riding therapy in the beginning of 1997. The Rider Classification scale was administered during the experimental group's first riding therapy session. Testing was conducted at the subjects' schools. The PH-CSCS and the PPNS was administered individually in the subject's language of choice. These questionnaires were completed by putting the questions to the subjects verbally.

(b) The Post-test Data Collection

The PH-CSCS, PPNS and the rider's Classification Scale was again administered after the subjects participated in riding therapy for ten weeks. The questionnaire for parents as well as the reports of the riding instructors and physiotherapists were completed at this time.

6.4 STATISTICAL TECHNIQUES

Because of the small sample size (13 pairs, 26 in total) of this study non-parametric methods were used to analyse the data.

The difference between the control and the experimental groups' self-concept, locus of control scores, as well as the pre- and post-test scores for these variables were investigated by use of the Wilcoxon matched-pairs signed-ranks T test. This test is appropriate for testing the difference between two correlated samples. The pre-test and post-test scores of the Rider's Classification Scale were also analysed by means of this test.

The possible correlation between self-concept, locus of control orientation, age, riding and the six cluster scales of the Piers Harris Children's Self-concept scale was investigated by use of Spearman's r_s. Spearman's r_s is a special case of the Pearson product moment correlation coefficient and is used when the number of pairs or scores is small (less than 20), as in the case of this study (13 pairs).

CHAPTER 7

RESULTS

7.1 DESCRIPTIVE STATISTICS

The descriptive statistics of this study are discussed by referring to the results of the total group (experimental and control groups combined) and the control and experimental groups individually. The pre-test and post-test descriptive statistics of the combined group can be used to describe the locus of control orientation, self-concept and physical improvements of a group of South African cerebral palsied children, who attend a special school for cerebral palsied children.

7.1.1 Age

The average age of the total group of subjects was 10,5 years for both the pre-test and the post-test and the standard deviation was 2,27. The oldest subject of the combined group was 16 years old and the youngest was 7 years old.

The average age of the experimental group was 10,33 years for both the pre-test and the post-test. The youngest subject was 7 years old and the oldest was 14 years old.

The average age of the control group was 10,67 years for both the pre-test and the post-test. The variance for this group was 6,42 and the standard deviation was 2,54. . Although subjects were paired, the average age of the control group was slightly higher than that of the experimental group due to the fact that one of the experimental subjects (14 years of age) could only be matched by disability to a 16 year old subject.

7.1.2 Self-Concept

The descriptive statistics for the combined experimental and control groups are summarised in Table 7.1.

Table 7.1:

Pre-Test and post-test descriptive statistics: Total Group (N=24)

VARIABLE	MEAN		MINIMUM		MAXIMUM		STD DEV	
	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Pre Test	Pre Test	Post Test
Locus of Control (NS-LCSC)	12,50	12,13	8	6	16	18	2,06	2,97
Self-Concept (PH-CSCS)	56,71	57,83	40	44	69	70	7,99	8,27
Behaviour (Subtest 1)	12,71	12,38	8	5	16	15	2,33	2,75
Intellectual Status (Subtest 2)	12,46	12,79	7	8	15	17	1,89	2,67
Appearance (Subtest 3)	9,46	9,38	6	5	13	12	2,04	1,69
Anxiety (Subtest 4)	8,29	8,75	2	4	13	14	3,22	3,33
Popularity (Subtest 5)	8,13	8,33	3	4	11	11	2,15	2,32
Happiness (Subtest 6)	7,83	8,04	3	5	10	10	1,86	1,40
Age	10,50	10,5	7	7	16	16	2,27	2,27

7.1.2.1 Total Self-Concept Scores

According to Piers (1984) there were no consistent sex or grade differences found in results of a normative sample of 1 183 school children from a public school system in a small North American town. The study reported a mean total self-concept score of 51,84 and a standard deviation of 12,87. Piers (1984) presented the results of an accumulated sample of 3 692 "normal" school children. The mean of this sample was 55,2 and the standard deviation 12,6. The mean self-concept score of the South African group of cerebral palsied children was 56,71 (pre-test) and 57,83 (post-test). The total self-concept scores of the combined

group of cerebral palsied children, as measured by the Piers-Harris Self-Concept Scale for Children, was slightly higher than the mean scores of the normative samples provided by Piers (1984). The pre-test and post-test descriptive statistics of the experimental group are summarised in Table 7.2.

Table 7.2:

Pre-Test and post-test descriptive statistics: Experimental Group (N=12)

VARIABLE	MEAN		MINIMUM		MAXIMUM		STD DEV	
	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Pre Test	Pre Test	Post Test
Locus of Control (NS-LCSC)	13,17	12,92	11	8	15	16	1,47	2,15
Self-Concept (PH-CSCS)	55,83	55,92	40	44	68	70	9,42	9,87
Behaviour (Subtest 1)	12,42	11,33	8	5	16	15	2,47	3,45
Intellectual Status (Subtest 2)	11,92	12,00	7	8	15	16	2,31	2,66
Appearance (Subtest 3)	8,83	9,50	6	8	13	12	1,13	1,45
Anxiety (Subtest 4)	8,75	8,58	2	4	13	14	3,47	3,50
Popularity (Subtest 5)	7,92	7,50	3	4	11	11	2,47	2,81
Happiness (Subtest 6)	7,75	8,18	3	6	10	10	2,18	1,27
Rider Classification Scale	7,17	11,25	6	9	9	14	1,03	1,55
Age	10,33	10,33	7	14	7	14	2,06	2,06

The mean pre-test self-concept scores for the experimental group was 55,83 and the mean post test score was 55,92. The minimum pre-test score was 40 and maximum pre-test score was 68. The minimum and maximum post-test scores were slightly higher at 44 and 70. The standard deviation for the pre-test self-concept scores was 9,42 and the post-test standard deviation was 9,87. The pre- and post-test mean for this test seem to be very similar. The post-test maximum and minimum scores do however seem to be slightly higher.

The control group's mean pre-test self-concept score as measured by the Piers-Harris Children's Self-Concept Scale was 57,58 and the mean post test score was 59,75. The standard deviation for the pre-test self-concept scores was 6,57 and the post-test standard deviation was 6,12. The minimum pre-test score was 49 and maximum pre-test score was 69. The minimum and maximum post-test scores are very similar at 50 and 69. The pre-test and post-test descriptive statistics of the control group are summarised in Table 7.3.

Table 7.3:

Pre-Test and post-test descriptive statistics: Control Group (N=12)

VARIABLE	MEAN		MINIMUM		MAXIMUM		STD DEV	
	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Pre Test	Pre Test	Post Test
Locus of Control (NS-LCSC)	11,83	11,33	8	6	16	18	2,41	3,53
Self-Concept (PH-CSCS)	57,58	59,75	49	50	69	69	6,57	6,12
Behaviour (Subtest 1)	13,00	13,42	9	11	16	15	2,26	1,24
Intellectual Status (Subtest 2)	13,00	13,58	11	9	14	17	1,21	2,54
Appearance (Subtest 3)	10,08	9,25	7	5	13	12	1,83	1,96
Anxiety (Subtest 4)	7,83	8,92	2	4	13	13	3,04	3,29
Popularity (Subtest 5)	8,33	9,17	6	7	11	11	1,88	1,34
Happiness (Subtest 6)	7,92	7,92	5	5	10	10	1,56	1,56
Age	10,67	10,67	7	16	7	16	2,54	2,54

7.1.2.2 Sub-scale Scores

Piers (1984) provided mean sub-scale scores for a normative sample of 485 North American public school children.

Behaviour:

The mean of the normative sample (11,44) was slightly lower than the combined cerebral palsied sample (12,71 pre-test, and 11,79 post test). The experimental group's mean pre-test score was 12,42 and the mean post-test score was 11,33. The control group's pre-test score was slightly higher at 13,00 and the post test score was 13,42. This sub-scale indicates the extent to which the child admits or denies problematic behaviour. A low score suggests acknowledged behavioural difficulties (Piers , 1984). The cerebral palsied sample's behaviour sub-scale scores are considered to be within a normal range.

Intellectual and School Status:

This sub-scale reflects the child's self-assessment of his or her intellectual and academic abilities, including general satisfaction with school and future expectations (Piers, 1984). The mean of the normative sample (11,62) was slightly lower than the combined cerebral palsied sample (12,46 pre-test, and 12,79 post-test). The experimental group's scores were similar at 11,92 (pre-test) and 12 (post-test). The control group's scores were slightly higher at 13,00 (pre-test) and 13,58 (post-test). These scores were within the normal range, which indicates that most of the subjects did not experience specific difficulties with school-related tasks.

Physical Appearance and Attributes:

This scale reflects the child's attitudes concerning physical characteristics and attributes such as leadership and the ability to express ideas (Piers, 1984). The mean of the normative sample (8,31) was slightly lower than the combined cerebral palsied sample (9,46 pre-test, and 9,38 post test). The experimental

group's mean scores were 8,83 (pre-test) and 9,50 (post-test). The control group's mean scores, as the experimental mean scores, were slightly higher than the normative data at 10,00 (pre-test) and 9,25 (post-test).

Anxiety:

This scale reflects general emotional disturbance and dysphoric mood. The items included in this scale tap emotions such as worry, nervousness, shyness, sadness, fear, and a general feeling of being left out of things (Piers, 1984). The mean of the normative sample (9,54) was slightly higher than for the combined cerebral palsied sample (8,29 pre-test, and 8,75 post test). The experimental group's anxiety mean scores were: 7,83 (pre-test) and 8,92 (post-test) and the control group's were 8,75 (pre-test) and 8,58 (post-test).

The PH-CSCS is scored in the direction of positive self-concept, so that the higher the score, the more positive the child's self-concept (Piers, 1984). A low score for this sub-scale thus reflects anxiety. The minimum pre- and post-test scores for this sub-scale was 2 and 4, which was very low. There is thus a possibility that some of the subjects in this group experience emotional disturbance, nervousness, shyness, sadness and fear.

Piers (1984) suggests that individual item responses can be examined to determine the nature of the child's concern. The most common items are as follow:

	Pre-Test	Post-test
Item 28. I am nervous	58,33%	62,50%
Item 37. I worry a lot	50,00%	58,33%
Item 43. I wish I was different	50,00%	54,17%
Item 74. I am often afraid	50,00%	41,00%

Popularity:

This 12 item sub-scale reflects the child's perceived popularity with peers and the ability to make friends (Piers, 1984). The mean of the normative sample (8,27) was very similar to the combined cerebral palsied sample (8,13 pre-test, and 8,33 post test). The experimental group's mean pre-test score was 7,92 and the post-test mean score was 7,50. The control group's mean scores for this sub-scale was 8,33 (pre-test) and 9,17 (post-test) and was slightly higher than that of the experimental group. This indicates that most of the subjects did not experience problems with shyness, interpersonal skills or feel that they are isolated from others.

Happiness and Satisfaction:

This sub-scale evaluates the extent to which subjects feel they are happy, easy to get along with, and generally feels satisfied with life (Piers, 1984). The mean of the normative sample (8,05) was very similar to the cerebral palsied sample (7,83 pre-test, and 8,04 post test). The minimum scores of the combined group for this sub-test was quite low at 3 (pre-test) and 5 (post-test) which indicates that a minority of the children might feel dissatisfied with life in general. The mean pre-test score of the experimental group was 7,75 and the mean post test score was 8,18. The control group's mean scores were very similar at 7,92 for both the pre- and post tests.

7.1.3 Locus of Control Orientation

Nowicki and Duke (1974) provides normative data from a group of 240 children ranging ages 5-8 years old. There are 26 items in this scale and the highest possible score is therefore 26, lowest possible score 0. A high score indicates external locus of control and a low score, internal locus of control. The mean scores for the age group 7-8 years was 11,45. This was slightly lower (more

internal) than the combined group's mean at 12,50 (pre-test) and 12,13 (post-test). The pre- and post test scores were very similar. A score of 12 was therefore a fairly normal score (not highly external or internal).

The mean pre-test locus of control score of the experimental group was 13,17 and the mean post test score was 12,92. The minimum pre-test score was 11 and maximum pre-test score was 15. The minimum and maximum post-test scores were slightly more internal at 8 and 16. The standard deviation for the pre-test locus of control scores was 1,47 and the post-test standard deviation was 2,15. As with the combined group, there was a slight decrease in the post-test score. The group as a whole scored slightly more internally in the post-test. Their locus of control orientation was slightly more external than the mean group of 7 and 8 year olds.

The mean pre-test locus of control score of the control group as measured by the Nowicki-Strickland Pre-Primary Locus of Control scale was 11,83 and the mean post test score was 11,33. The minimum pre-test score was 8 and maximum pre-test score was 16. The range of the minimum and maximum post-test scores was slightly bigger at 6 and 18. The standard deviation for the pre-test locus of control scores was 2,41 and the post-test standard deviation was 3,53. The control group seems to be slightly more internally orientated than the experimental group. The control group's mean scores for this test was very similar to those of the normative 7 to 8 year old sample.

7.1.4 Rider Classification Scale Scores

The mean pre-test score for the Rider Classification Scale was 7,17 and the post-test mean was 11,25. The standard deviation for the scores of this scale was 1,03 for the pre-test and 1,55 for the post-test. The minimum pre-test score was 6 and maximum pre-test score was 9. The minimum and maximum post-test scores were significantly higher at 9 and 14.

7.2 INVESTIGATING THE DIFFERENCES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS

7.2.1 Differences between the experimental and control groups' pre-test scores

The differences between the experimental and control group's pre-test scores was investigated by means of the non-parametric statistical test, the Wilcoxen Sign Ranks Test. The pre-test scores for the experimental and control groups are summarised in Table 7.4.

Table 7.4:

Wilcoxen Sign Ranks Test Pre-Test Scores for the Experimental and Control Groups (N=12 pairs)

VARIABLE	Z	p (two tailed)
Locus of Control (NS-LCSC)	-1,668	0,095
Self-Concept (PH-CSCS)	-0,058	0,954
Behaviour (Subtest 1)	-0,557	0,578
Intellectual Status (Subtest 2)	-1,182	0,237
Appearance (Subtest 3)	-1,606	0,108
Anxiety (Subtest 4)	-0,755	0,450
Popularity (Subtest 5)	-0,178	0,859
Happiness (Subtest 6)	-0,118	0,907

The p-values of all of the pre-test variables are larger than 0,05 and there were therefore no significant differences between the pre-test scores of the control group and the experimental group.

7.2.2 Differences between the experimental and control groups' post-test scores

The differences between the experimental and control group's post-test scores were also investigated by means of the Wilcoxen Sign Ranks Test. The pre-test scores for the experimental and control groups are summarised in Table 7.5.

Table 7.5:

Wilcoxen Sign Ranks Test Post-Test Scores for the Experimental and Control Groups (N=12 pairs)

VARIABLE	Z	p (two tailed)
Locus of Control (NS-LCSC)	-1,279	0,201
Self-Concept (PH-CSCS)	-0,955	0,340
Behaviour (Subtest 1)	-1,207	0,227
Intellectual Status (Subtest 2)	-1,458	0,145
Appearance (Subtest 3)	-0,118	0,906
Anxiety (Subtest 4)	-0,204	0,838
Popularity (Subtest 5)	-1,291	0,197
Happiness (Subtest 6)	-0,325	0,745

There were no significant differences between the post-test scores of the control group and the experimental group

7.3 INVESTIGATING CORRELATION BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS

7.3.1. Investigating correlation between the experimental and control groups

This section of the chapter focuses on the correlation between the variables investigated. The Spearman correlation coefficients between the pre-test scores of the combined group of subjects are depicted in Table 7.6. The results provide an insight into the group as a whole and may be compared to results of other studies.

Table 7.6:

Spearman Correlation Coefficients for Experimental and Control Group Pre-Test Scores (N=24 pairs)

VARIABLE	Self-Concept	Behaviour	Intellectual Status	Appearance	Anxiety	Popularity	Happiness	Age
Locus of Control	0,243	0,214	0,104	0,014	0,248	-0,015	0,248	-0,051
Self-Concept		0,660*	0,276	0,302	0,674*	0,703*	0,558*	0,122
Behaviour			0,100	0,468*	0,488*	0,435*	0,558*	0,122
Intellectual Status				0,205	0,207	0,216	0,079	-0,033
Appearance					0,323	0,151	0,649*	-0,131
Anxiety						0,578*	0,613*	0,081
Popularity							0,312	0,136
Happiness								0,163

(* $p \leq 0,05$)

The locus of control scores did not correlate significantly with any of the other variables. The total self-concept scores correlated significantly with the behaviour, anxiety, popularity and happiness sub-scales. It did not, however correlate with intellectual status and appearance sub-scale scores. The behaviour sub-scale scores correlated significantly with appearance, anxiety, popularity and happiness sub-scales. Intellectual status sub-scale, and age did not correlate with any of the other variables. Physical appearance sub-scale only correlated significantly with the behaviour and happiness sub-scales. Anxiety sub-scales correlated significantly with behaviour, popularity and happiness sub-scales. Popularity correlated significantly with behaviour and anxiety sub-scales. . Happiness correlated significantly with behaviour, appearance and anxiety sub-scales.

7.3.2 Discussion of Intercorrelations

a) Total Self-Concept and Sub-scales

Piers (1984) stated that all intercorrelations between subtest scores and total self-concept scores are significant ($p < 0,01$; $n=485$) and that all subtests appear to be assessing a global self-concept to some extent. One obvious reason is that some items are shared, that is they contribute to more than one sub-scale.

The intercorrelations of the combined pre-test scores, however, did not all correlate significantly. In particular, intellectual status did not correlate significantly with locus of control orientation, total self-concept, behaviour, physical appearance, anxiety, popularity, happiness or age. Physical appearance and attributes did not correlate significantly with total self-concept (non-parametric method), locus of control orientation, anxiety, or popularity.

This phenomena could be explained by the fact that these particular physically disabled children's self-assessment of their intellectual and academic abilities,

including general satisfaction with school and future expectations differ from physically normal children who attend normal schools. The physical appearance sub-scale reflects the child's attitudes concerning physical characteristics and attributes such as leadership and the ability to express ideas. The fact that the physical appearance scores did not correlate significantly with any other variables but total self-concept and happiness is also an indication that these subjects perceive themselves differently. There was no significant correlation between happiness and popularity.

Although the mean scores of the total group of cerebral palsied subjects did not differ greatly from normative means produced by Piers (1984), there are definite differences in the intercorrelations of sub-scales and total scores of this disabled group and the normative sample of Piers (1984).

7.4 DIFFERENCES BETWEEN THE EXPERIMENTAL GROUP'S PRE-TEST AND POST-TEST RIDER CLASSIFICATION SCALE SCORES

The Rider Classification Scale aims to evaluate the rider's competency or riding capability. A low score indicates a low level of competency or capability and a high score the opposite. The pre- and post-test scores of the experimental group were compared by means of the non-parametric Wilcoxen Sign Ranks Test. The results are depicted in Table 7.7.

Table 7.7:

Wilcoxen Sign Ranks Test Scores for the Experimental Group's Pre-Test and Post Test Scores of the Rider Classification Scale (N=12 pairs)

VARIABLE	Wilcoxen Sign Ranks Test	
	Z	p (two tailed)
Riding Ability (Rider Classification Scale)	-3,075	0,0021*

(* $p \leq 0,05$)

The p-value was significant at 0,0021. This indicates that there was a significant difference between the pre- and post-test scores. The post-test scores' mean was higher than the pre-test mean and it can therefore be assumed that there was a significant improvement in capability and riding competence. The subjects significantly improved their riding ability after 12 riding sessions.

7.5 CASE STUDIES

The aim of this section of this chapter is to personify the changes and progress that subjects of this study undergone since they started riding therapy. This is done by discussing two typical case studies and by reflecting the views of the SARDA helpers who were involved in this study. Each case study describes these changes as observed by the subjects' parents and the personal helpers at SARDA. The observations of the parents were obtained from the Parent's Questionnaire and those of the helpers was obtained by short summaries written by the helpers about their subjects individual progress. The following two cases were selected because their profile was typical of the group. The subjects participated in riding therapy every second week. The two subjects discussed in these case studies rode the same horse, one every alternate week and thus had the same helper.

7.5.1 Case Study Number 1

Case Study Number 1 (S1) is a 13 year old girl, suffering from hemiplegic cerebral palsy. Her total Piers-Harris self-concept score increased from 64 to 66 and her Nowicki-Strickland locus of control score increased from 13 to 16 (lower scores indicate an internal locus of control).

The overall results of the parents' questionnaire indicate that several positive changes occurred in the subject's functioning since she commenced with riding

therapy. According to her parents, her balance and posture has improved and she seems to be more supple. The subject seems to have greater muscle strength and improved control of her upper and lower extremities. She is performing her daily activities with greater ease. The subject looks forward to her riding lessons and enjoys it. She seems to be more motivated to get involved with new activities. Her parents are of the opinion that her self-concept has improved and that she is less anxious and afraid since she started riding therapy. According to her parents, she does not find walking with her walking apparatus easier and showed no improvement in her relationships with piers and siblings. She seems to have become more aggressive since she started riding therapy and tend to fight with siblings and piers more often. This finding is consistant with those of MacKinnon et al. (1994).

This subject's helper is of the opinion that the subject benefited greatly from riding therapy. The subject has speech difficulties and communication is conducted verbally and through body language and facial expressions. The subject was very nervous at the start of the year, but progress has been made in mounting and controlling the pony. The height of the horse and the movement under their bodies, initially induced fear. This has, however, been overcome as the months progressed. The subject's co-ordination when mounted has improved, particularly when performing exercises. The subject was shy and withdrawn at the beginning of the year, but is now showing signs of enjoying the lessons. She is communicating verbally and gaining confidence. She was stiff and rigid (physically), but has now grown to relax as a rider. The helper feels that the subject's progress will be maintained and that the subject has benefited greatly from her participation in riding therapy.

This subject's riding abilities improved greatly during her participation in riding therapy and was monitored and evaluated by the Rider's Classification Scale. During the subject's first riding lesson two persons were needed to support her on the horse, namely a helper who lead the horse and another person supporting her

when mounted on the horse. This means that this subject had no control over her horse - the control was in the hands of the leader. She had great difficulty balancing herself and could not assume the correct sitting position on the horse. There was total lack of control concerning the upper and lower extremities. She performed all tasks with the help of the helper or the leader. She was hesitant and anxious but seemed to be willing when encouraged.

When the subject was evaluated six months later, it was clear that her riding abilities improved greatly. She no longer needed a second person to support and balance her when mounted on the horse. She could perform some tasks alone, others with the help of the leader. She was however still in need of constant support and reinforcement. She showed improvement in the control of her upper extremities, though control of the lower extremities was still poor. She could now, however, assume the correct sitting position on the horse without the help of the leader for a few minutes at a time.

7.5.2 Case Study Number 2

This subject is a boy of 14 years, who suffers from Athetoid Cerebral Palsy. His total Piers-Harris self-concept score increased from 57 to 70. and his Nowicki-Strickland locus of control score dropped from 15 to 12 (lower scores indicate an internal locus of control).

The results of the Parents' Questionnaire indicate that the subject's balance, suppleness, muscle strength and posture improved. His parents were however not convinced that there was an improvement in control of the subject's upper and lower extremities. They did notice that the subject finds it easier to move around, and that he finds his daily tasks (e.g. getting dressed) a little easier. The subject looks forward to his riding therapy and enjoys horse riding. The subject is more motivated and enthusiastic about new activities and his self-concept has

improved, according to his parents. He relationships with peers and siblings did not improved and his parents perceived him as more aggressive since he started riding. His parents commented that the subject enjoys the riding therapy tremendously. He seems not to be falling over so much. He is the type of person who is enthusiastic about trying new things and is very helpful.

The helper who worked with this subject indicated that the subject's confidence was growing from week to week. His enthusiasm does not stop at horse riding, he is also enthusiastic when it comes to stable management and grooming (brushing) his horse. This helper really enjoyed helping the subject. He seems particularly happy on horseback and tries very hard to follow instructions correctly. In the process he seems to have taken on a leadership role for the group.

During the subject's first riding lesson, he needed only one helper to lead the horse, as he was physically able to stay mounted without help. He could perform some of the tasks on his own, but occasionally needed help from his helper. He was anxious, hesitant and stubborn at times, but willing when encouraged. He needed constant reinforcement and support from his helper. The subject has good upper extremity control, but had difficulty controlling the lower extremities. His balance was relatively poor and he could not assume the correct sitting position (vertically aligned) on the horse.

After participating in riding therapy for 6 months, every second week, the subject was able to perform all tasks without the help of the helper. His attitude changed and he became willing, competent and co-operative. He was now able to assume the correct sitting position when mounted at all times.

7.5.3 SARDA Helpers' view concerning the benefits of riding therapy.

The helpers who were involved with this group of children were asked to write down their comments of the subjects' progress, both physically and mentally. The response was tremendous and the written comments are included in the Addendum. The comments of the helpers who were involved with the above mentioned subjects were discussed within the case studies. Here follows a short summary of comments from other helpers.

a) Balance

One of the greatest improvements helpers noticed, was improvement in balance in the saddle. Most of the children who started riding therapy needing 2 helpers (one to lead the horse, and one to secure the child on the horse), progressed to a stage were they only needed a helper to lead the horse.

b) Muscle Stiffness and Tenseness

Some of the helpers commented that the children were physically stiff and tense when they started with riding therapy and that it took most of the first lesson just to get them to relax. One helper commented that the horse's movements seem to relax the rider. The rider seems tense and stiff when the horse is standing still, but as soon as the horse starts moving, the child's legs seem to relax and the child assumes the correct sitting position. After six months the children are at ease and confident.

c) Communication

Some of the children have speech difficulties. Some of these children do not communicate at all and were thus excluded from the experimental group. Helpers who deal with these children find that communication is verbally a one way affair at the beginning of the riding therapy programme. One helper commented that both the girls that she helped became quite alert and that their reactions could be judged by facial expressions and general body language.

d) Nervousness

Helpers indicated that the children all seem to be very nervous at the start of the riding therapy. The process of learning to mount and control the horse contributed to a decrease in nervousness. Small children (and even bigger children) find the prospect of sitting on a huge animal such as a horse or pony frightening, the movement of the horse underneath them even more so. These fears have been overcome as the months progressed and the children learnt to control the horse and became more co-ordinated.

CHAPTER 8

DISCUSSION & RECOMMENDATIONS

8.1 DISCUSSION

The purpose of the present study was to examine both the psychological and physical effects of a riding therapy progamme on a group of cerebral palsied children.

The conceptual framework on which this study is based suggests that physical improvement or the acquisition of a new physical skill will lead to an enhancement of self-concept and locus and control orientation in physically disabled children. The conceptual framework as discussed in Chapter 1 can be summarised as follows:

a) Physical Improvement and,

b) mastering of a new skill (horse riding) leads to

c) change in attitudes reflected by:

* improved self-concept and
* shift towards a internal locus of control orientation

8.1.1 Physical Improvement

The results of the Parents' Questionnaire and the comments from helpers show an improvement in the physical functioning of the subjects. It is important to note that these results are based on informal observations and not by primary research methodology. These reports indicate improvement of muscle strength,

muscle stiffness and tension, improved control of upper and lower extremities, improved balance and co-ordination. This group of children definitely showed signs of physical improvement during their participation in riding therapy as was also indicated by the results of the Rider Classification Scale. These findings are similar to those of Adams and MacCubbin (1991), MacKinnon et al. (1994), Mayberry (1978), Whalley (1980), Angier (1983), Harpoth (1970), and Hendrikson (1971).

8.1.2 Mastering the Skill of Horse Riding

The results of the Rider Classification Scale showed that the subjects significantly improved their horse riding skills during their participation in the SARDA riding therapy programme. Not one of the 12 subjects' post test scores are lower than their pre-test scores. Comments from helpers confirm that all of the subjects improved their horse riding skills during their participation in the progamme.

8.1.3 Change in attitudes

The results of the study indicated that the subjects benefited physically from participation in riding therapy and successfully mastered the skill of horse riding. We are therefore to assume that changes in their attitudes or attributions should have occurred.

8.1.3.1 Self-Concept

Horney & Pope (In Arnold and Chapman, 1992) state that discrepancies between the "actual" and "ideal" self could have a negative influence on self-concept. Several studies have shown that the self-concept of disabled children tend to differ from those of normal children (Arnold and Chapman, 1992; Brinkmann and Hoskins, 1979; Harvey and Greenway, 1984). Although this theory seem to

be very much applicable to the physically disabled child, several studies have failed to show a difference between the self-concept of disabled and normal children (Magill-Evans and Restall, 1991; King et al, 1993; Aplleton et al, 1994). The results of the present study agree with those of these authors. The overall self-concept scores of this group is only slightly lower than those of able bodied American children of the same age group. This difference is not statistically significant.

The quantitative results of the present study did not indicate a significant increase in self-concept and locus of control orientation. There was, however a significant increase in Rider Classification Scale scores, indicating an improvement in riding ability. The qualitative investigation of this study did, however, produce results. Both the parents of the subjects as well as helpers observed that subjects seemed more self-confident, less anxious and nervous, more communicative and enthusiastic. These findings are similar to those of MacKinnon et al. (1994), Mayberry (1978), Walker, (1978), Whalley (1980), Angier (1983), Woods (1990) and Henrikson (1977). Once again, it is important to realise that these results are based on informal observations and not by means of primary research methodology.

8.1.3.2 Locus of Control Orientation

It is suggested that the disabled subjects participating in this study will shift toward an internal locus of control orientation because of the physical control that they exert over a living animal and the successful mastering of the skill of horse riding. Berk (1994) suggests that childrens' attributions can be shifted toward being internally orientated by encouraging them to believe that they can overcome failure by exerting more effort. When children receive positive feedback despite the fact that failure might occur at times, the child will be challenged to revise his attributions.

The results of the Nowicki-Strickland Pre-Primary Locus of Control Scale were not significant. There was no movement towards an internal locus of control orientation. Again the qualitative results of this study showed that these subjects did in fact exert an amazing amount of effort to master the skill of horse riding. Several parents reported that their children have become more assertive towards their peers, and that the subjects tend to be enthusiastic concerning new challenges. Several helpers reported that their subjects tried hard to perform tasks and that they did not hesitate to tackle new tasks.

8.2 RECOMMENDATIONS

The results of this study supports the conceptual framework as represented in Chapter 1. Subjects did improve physically and mastered a new skill in horse riding. These subjects showed altered attitude in self-concept and orientation of attributes. This was shown via observations by the subjects' parents and helpers. Quantitative measures (Piers-Harris Children Self-Concept Scale (PH-CSCS) and Nowicki-Strickland Pre-Primary Locus of Control Scale(PPNS) however did not confirm this change in attitude.

The following two deductions could be made:

a) Helpers and Parents' observations were unreliable - which is unlikely;
b) The quantitative measures did not measure what they were supposed to measure.

The first deduction is highly unlikely as there is a strong correlation between observations of parents and helpers. These observations also strongly correlate with the results of various studies Adams and MacCubbin (1991), MacKinnon et al. (1994), Mayberry (1978), Whalley (1980), Angier (1983), Harpoth (1970), and Hendrikson (1971). This implies that the quantitative measures' results should

be taken with a pinch of salt. However, this is merely a subjective view based on the experience of this author.

The PH-CSCS is a multi-dimensional instrument which includes "adjustment" as well as self-esteem items such as anxiety and happiness (Fleming and Courtney, 1984). Piers and Harris (Piers, 1984) states that self-concept is simply a total of all the parts of self-concept, with all parts being equally weighted.

Such a unitary approach has been used in most studies involving children with disabilities. Most of these studies have been directed toward the discovery of differences between groups or to determine whether a particular manipulation affects self-concept (Harvey and Greenway, 1982). Mayberry (1989) states that the unitary approach presents two major problems for therapists who use the information for intervention:

1. If all self-concept elements contribute equally to self-concept, then positive self-concept can be improved by improving one or more of the elements.

2. The amount of change in self-concept will be directly related to the amount of change in the elements.

Many professionals and scholars however, have reported how small changes in ability seem to result in large changes in self-concept and vice versa. It can therefore be recommended that future studies of this kind take care in selecting measuring instruments. Although the PH-CSCS is widely recognised and used, there might be more appropriate scales relating to the self-concepts of disabled children.

The PPNS scale was developed out of the original Nowicki Strickland Locus of Control Scale for children, because it was felt that there was a need for a locus of

control scale for children of 8 years and younger (Nowicki and Duke, 1974). It is the opinion of this author that some of the items of the PPNS is too complex for young children, especially disabled children from a lower socio-economic background. Specific questions with which subjects had great difficulties were:

(7) Do you believe that wishing can make good things happen?

(14) When something goes wrong is there usually little you can do to make it right again?

(17) When somebody your age wants to be your enemy, is there anything you can do to make him or her like you?

(22) Are you the kind of child who believes that thinking about what you are going to do makes things turn out better?

(23) Do you think it's better to be smart than to be lucky?

It appears that the sentence structure and contents of these questions could be confusing and intricate to the subjects. It is thus recommended that a simpler form of measurement be used to determine locus of control orientation. The subjects who participated in this study, as mentioned before, are from a lower socio-economic background. This factor must be taken into account concerning the difficulty of instruments used. This particular scale was used because it was the most simple one available. Future studies might need to develop an instrument specifically for use of disabled children or children from a lower socio-economic background.

This study can be further pursued by investigating the long-term benefits of riding therapy and by investigating other personality variables such as anxiety and self-efficacy. The benefits of riding therapy need to be investigated

regarding other groups of subjects such as children with behavioural problems, schizophrenia, other disabled groups and children with chronic illnesses.

The need for research concerning the benefits of riding therapy is crucial in considering the optimal use of this therapy in South Africa. Disabled persons in South Africa have been disempowered, isolated and marginalised from main stream society. Riding therapy provides physical exercise, social development and integration, aside from being therapeutic.

This study was exploratory of nature. It stands to provide a foundation from which future studies can be derived. The qualitative results show that the professionals and other persons involved with this therapy recognise great improvements and changes in participants, both physically and psychologically.

To conclude this study the view of Peacock (quoted in Wood, 1990), as stated in Section 1.2.1, seems to be particularly relevant::

> *We require more documented results with properly controlled studies and large numbers of fully assessed riders before we can prove the validity of riding therapy to the uninitiated and indeed ourselves (p 333).*

---OOO---

"IN RIDING, WE BORROW FREEDOM..."

HELEN THOMAS - UNKNOWN SOURCE

---OOO---

REFERENCES

Adams, R.C. & McCubbin, J.A. (1991). Games, Sports, and Exercises for the physically disabled. Lea & Febiger: Philadelphia.

Allport, G.W. (1955). Becoming. New Haven: Yale University Press.

Angier, N. (1988). Four legged friends. Discover, Aug, 87-89.

Appleton, P.L., Minchom, P.E., Ellis, N.C., Elliot, C.E., Boll, V., & Jones, P. (1994). The self-concept of young people with spina bifida: a population-based study. Developmental Medicine and Child Neurology, 36, 198-215.

Arnold, P. & Chapman, M. (1992). Self-esteem, aspirations and expectations of adolescent with physical disability. Developmental Medicine and Child Neurology, 34, 97-102.

Bain, A.M. (1965). Pony riding for the disabled. Physical Therapy, 51, 263-265.

Berk, L.E. (1993). Infants, children, and adolescents. Massachusetts: Allyn and Bacon.

Berk, L.E. (1994). Child Development, (3rd Ed). Massachusetts: Allyn and Bacon.

Bertoti, D.B. (1988). Effect of therapeutic horseback riding on posture in children with cerebral palsy. Physical Therapy, 68(10), 1505-1512.

Brinkmann, J.R. & Hoskins, T.A. (1979). Physical conditioning and altered self-concept in rehabilitated hemiplegic patients. Physical Therapy, 58(7), 859-865.

Burns, R.B. (1979). The Self Concept: Theory, measurement, development and behaviour. New York: Longman.

Byrne, B.M. (1984). The general/academic self-concept nomological network: a review of construct validation research. Review of Educational Research, 54(3), 427-456.

Carlson, E.A. (1983). The effects of a program of therapeutic horsemanship on the self-concept and locus of control orientation of the learning disabled. Dissertation Abstracts International, 43(12), 4123-B.

Cawley, R., Cawley, D., & Retter, K. (1994). Therapeutic horseback riding and self-concept in adolescents with special educational needs. Anthrozoös, 7(2), 129-134.

Cellini, J.V., & Kantorowski, L.A. (1982). Internal-External Locus of Control: New normative data. Psychological Reports, 51, 231-235.

Chadha, N.K. (1989). Causal antecedents of self-concept, locus of control, and academic achievement. Psychologia, 32, 264-268.

Copeland Fitzpatrick, J. (1994). The role of riding therapy in the treatment of spastic Cerebral palsy following selective posterior Rizotomy. 8th International Therapeutic Riding Congress, New Zeeland, 1994.

Crandall, V.C., Katkovsky, W., & Crandall, V.J. (1992). Effects of a stress-control program on children's locus of control, self-concept, and coping behaviour. Child development, 36, 91-109.

Cruickshank, W.M. (Ed.). (1976). Cerebral Palsy - A developmental disability. New York: Syracuse University Press.

Dallas, E., Stevenson, J., & McGurg, H. (1993). Cerebral-palsied children's interactions with siblings - I. Influence of severity of disability, age and birth order. Journal of Child Psychology and Psychiatry, 34(5), 612-647.

De Lange, C.A. (1988). A Psychological Evaluation of a group of Cerebral Palsy Pupils. Unpublished master's thesis, Univerisity of Potchefstoom.

Denhoff, E. (1976). medical Aspects of Cerebral Palsy. In Cerebral Palsy: A Developmental Disability. Cruickshank, W.M. (Ed.), 29-71. New York: Syracuse University Press.

DePauw, K.P. (1986). Horseback Riding for individuals with disabilities: Programs, Philosophy, and Research. Adapted Physical Activity Quarterly, 3, 217-226.

Duggan, M.B. & Ogala, W. (1982). Cerebral Palsy in Nigeria - A report from Zaria. Annals of Tropical Paediatrics, 2, 7-11.

Epstein, R., & Komorita, S.S. (1971). Self-Esteem, success-jailure, and locus of control in Negro children. Developmental Psychology, 4(1), 2-8.

Epstein, S. (1973). The self-concept revisited. American Psychologist, 5, 404-416.

Fischer, J. & Corcoran, K. (Eds.). (1987). Measures for Clinical Practice: A sourcebook. (Vol.I). New York: The Free Press.

Fleming, J.S. & Courtney, B.E. (1984). Dimensionality of Self-Esteem: II. Hierarchical facet model for revised measurement scsales. Journal of Personality and Social Psychology, 46(2), 404-421.

Fleming, J.S., & Watts, W.A. (1980). The dimensionality of self-esteem: Some results of a College Sample. Journal of Personality and Social Psychology, 39(5), 921-929.

Franklin, M.R. Jr., Duley, S.M., Rousseau, E.W., & Sabers, D.L. (1981). Construct validation of the Piers-Harris Children's Self-Concept Scale. Educational and Psychological Measurement, 41, 439-443.

Greef, A.P. (1988). 'n Ondersoek na die verband tussen drie selfkonsep vraelysde en die daarstelling van 'n voorlopige vraelys. Unpublished Masters thesis: University of Stellenbosch.

Harper, D.C. (1991). Paradigms for Investigating Rehabilitation and Adaptation to Childhood Disability and Chronic illness. Journal of Pediatric Psychology, 16(5), 533-542.

Harpoth, U. (1970). Horseback riding for the handicapped. Physical Therapy, 50(2), 235-236.

Harvey, D.H.P., & Greenway, A.P. (1984). The self-concept of physically handicapped children and their non-handicapped siblings: An empirical investigation. Journal of Child Psychology and Psychiatry, 25(2), 273-284.

Haskin, M.R., Erdman, W.J., Bream, J., & MacAvoy, C.G. (1974). Therapeutic horseback riding for the handicapped. Archives of Physical and Medical Rehabilitation, 55, 473-474.

Hattingh, J.F.J. (Ed) (1987). Disability in the Republic of South Africa - Main Report. Department of National Health and Population Development.

Henderdon, P.A., Kelbey, T.J., & Engebretson, K.M. (1992). Effects of a stress-control program on children's locus of control, self-concept, and coping behaviour. The School Counselor, 40, 125-130.

Henriksen, J.D. (1971). Horseback riding for the handicapped. Archives of Physical and Medical Rehabilitation, 52(6), 282-283.

Integrated National Disability Strategy of the Government of National Unity (1996). Government Gazette, 369(17038).

Karumuna, J.M.S. and Mgone, C.S. (1990). Cerebral Palsy in Dar Es Salaam. Central African Journal of Medicine, 36(1), 8-10.

King, A.G., Shultz, I.Z., Steel, K., Gilpin, M., & Cathers, T. (1993). Self-evaluation and self-concept of adolescents with physical disabilities. American Journal of Occupational Therapy, 47(2), 132-140.

La Greca, A (Ed) (1990). Childhood Assesment: Through the eyes of a child. Boston: Allyn & Bacon.

Lefcourt, H.M. (1982). Locus of control, 2nd Edition. Hillsdale, New Jersey: Erlbaum.

Lefrancois, G.R. (1995). Of Children: An introduction to child development. Belmont, California: Wadsworth Publishers.

MacKinnon, J.R., Macphail, A., Noh, S., & Lariviere, J. (1994). Horseback riding for Cerebral Palsy children. 8th International Therapeutic Riding Congress, New Zeeland, 24-33.

Madonna, S.Jr., Bailey, G.K. & Wesley, A.L. (1990). Classroom environment and locus of control in identifying high and low self-concept in fourth- and fifth-graders. Psychological Reports, 66, 1152-1154.

Magill-Evans, J.E., & Restall, G. (1991). Self-Esteem of persons with cerebral palsy: From adolescence to adulthood. American Journal of Occupational Therapy, 45(9), 819-825.

Markus, H., & Kunda, Z. (1986). Stability and Malleability of the self-concept. Journal of Personality and Social Psychology, 51(4), 858-866.

Marsh, H.W. (1986). Global Self-Esteem: Its relation to specific facets of self-concept and their importance. Journal of Personality and Social Psychology, 51(6), 1224-1236.

Marsh, H.W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. Journal of Educational Psychology, 81(3), 417-430.

Marsh, H.W., Richards, G.E., & Barnes, J. (1986). Multidimensional Self-Concepts: The Effect of Participation in an outward bound program. Journal of Personality and Social Psychology, 50(1), 195-204.

Mayberry, R.P. (1978). The mystique of the horse is strong medicine: Riding as therapeutic recreation. Rehabilitation Literature, 39, 192-196.

Mayberry, W. (1990). Self-Esteem in children: Considerations for measurement and intervension. The American Journal of Accupational Therapy, 44(8), 729-734.

Mayberry, W. (1990). Self-Esteem in Children: Consideretions for Measurement and Intervention. The American Journal of Occupational Therapy, 44(8), 729-734.

Miller, M. (1989). Effects of sports instruction on children's self-concept. Perceptual and Motor Skills, 68, 239 - 242

Moyal, B.R. (1977). Locus of control, self-esteem, stimulus appraisal, and depressive symptoms in children. Journal of Consulting and Clinical Psychology, 45(5), 951-952.

Mukheibir, S.C. (1994). The relationship between sex-role identity, locus of control and self-concept amongst adolescent females within a historically disadvantaged community. Unpublished Masters Thesis: University of Stellenbosch.

Nelson, K.B. & Ellenberg, J.H. (1978). Epidemiology of Cerebral Palsy. Advances in Neurology, 19, 421-435.

Nowicki, S. Jr. & Duke, M.P. (1974). A Preschool and Primary Internal-External Control Scale. Developmental Psychology, 10(6), 847-880.

Nowicki, S., Jr., & Strickland, B.R. (1973). A locus of control scale for children. Journal for Consulting and Clinical Psychology, 40(1), 148-154.

Parker, D.F., Carriere, L., Habestreit, H., Salsberg,A., & Bar-Or, O. (1993). Muscle performance and gross motor function of children with spastic cerebral palsy. Developmental Medicine and Child Neurology, 35, 17-23.

Piers, E.V. (1984). Piers-Harris Children's Self-Concept Scale: Revised Manual. Los Angeles: Western Psychological Services.

Potterton, J. (1996). Cerebral Palsy in Giyani. South African Journal of Physiotherapy, 52(3), 66-68.

Ralph, A., Merrals, L., Hart, L., Porter, J.S., & Tan Su-Neo, A. (1995). Peer interactions, self-concept, locus of control, and avoidance of social situation of early adolescents. Australian Journal of Psychology, 47(2), 110-118.

Rees, D. (1981). The effect of a self-efficacy enhancing programme on the academic achievement of cerebral palsy children. Unpublished Masters Thesis: Rand Afrikaans University.

Rieger, C. (1978). Scientific principles of hippo- and riding therapy. Rehabilitation, 17, 15-19.

Robinson, J.P., Shaver P.R., & Wrightsman, L.S. (Eds.). (1991). Measures of personality and social psychological attitudes, Vol. 1, Academic Press.

Rogers, C.R. (1951). Client Centered Therapy. New York: Houghton Mifflin.

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, New Jersey: Princeton University Press.

Ross & Parker (1980). Academic and Social Self-Concept. Exceptional Children, 47, 6-10.

Rotter, J.B. (1954). Social Learning and Clinical Psychology. Englewood Cliffs, New Jersey: Prentice Hall.

Schilling, D.E. (1986). Self-esteem: Concerns, strategies, resources. Academic Therapy, 21(3), 301-306.

Selman, R.L. (1980). The growth of interpersonal understanding. New York: Academic Press.

Shavelson, R.J., Hubner, J.J., & Stanton, G.C. (1976). Self-Concept: Validation of construct interpretations. Review of Educational Research, 46(3), 407-441.

Spink, J. (1993). Developmental Riding Therapy: A Team Approach. Tucson, Arizona: Therapy Skill Builders.

Strang, L., Smith, M.D., & Rogers, C.M. (1978). Social Comparison, multiple reference groups and the self-concept of academically handicapped children before and after mainstreaming. Journal of Educational Psychology, 70(4), 487 - 497.

Strickland, B.R. (1989). Internal-External Expectancies. American Psychologist, 44(1), 1-12.

Strommen, E.A., Mckinney, J.P., & Fitzgerald, H.E. (Eds.). (1983). Developmental Psychology: The school-aged child. Illinois: The Dorsey Press.

The Reconstruction and Development Programme - A Policy Framework (1994). Johannesburg: Umanyano Publicaitons.

The White Paper on Reconstruction and Development (1994). Government Gazette, 353 (16085).

The Wonder of the bond between horses and the handicapped (1987). Fiat Lux, 33(2), 4-5.

Walker, G.M. (1978). Riding for the Disabled. Physiotherapy, 64(10), 297-298.

Whalley, K.R. (1980). Riding for the Disabled: Improving the quality of life. British Journal of Occupational Therapy, Aug., 267-268.

Wildstein, A.B., & Thompson, D. N. (1989). Locus of control, expectational set, and problem solving. Perceptual and Motor Skills, 68, 383-388.

Wingate, L. (1982). Feasibility of horseback riding as a therapeutic and integrative program for handicapped children. Physical Therapy, 62(2), 184-186.

Winne, P.H., Woodlands, M.T. and Wong B.Y.L. (1982). Comparability of self-concept among learning disabled, normal and gifted students. Journal of Learning Disabilities, 15, 470-475.

Winne, P.H.; Marx, R.W. and Taylor, T.D. (1977). A multitrait-multimethod study of three self-concept inventories. Child Development, 48, 893 - 901.

Wolf, T.M., Sklov, M.C., Hunter, L.S., Webber, L.S., & Berenson, G.S. (1982). Factor analytic study of the Piers-Harris Childrens self-concept scale. Journal of Personality Assessment, 46(5), 511-513.

Wood, J. (1990). The therapeutic value of horseriding for the disabled. Social Work, 26(4); 330-350

Wright, B.A. (1960). Physical Disability - A Psychological Approach. New York: Harper & Row.

Yong, F.L. (1994). Self-concepts, locus of control, and machiavellianism of ethnically diverse middle school students who are gifted. Roeper Review, 16(3), 192-194.

Zemke, R., Knuth, S., & Chase, J. (1984). Change in self-concepts of children with learning difficulties during a residential camp experience. Occupational Therapy in Mental Health, 4(4), 1-12.

ADDENDUM 1

1.1 RIDER CLASSIFICATION SCALE

a) Assistance Score:

1. If the rider needed a helper who lead the horse and another person supporting the rider on the horse.
2. If the rider needed only one helper who lead the horse at all times.
3. If the rider needed one helper who lead the horse, but the rider rode alone at times.

b) Task Control Score:

1. If the rider performed all tasks with help from the helper or leader.
2. If the rider performed some tasks alone and some with help from the helper or leader.
3. All tasks were performed without help from the helper or leader.

c) Behaviour Score:

1. If the rider was maladaptive and non-compliant for most of the riding therapy session, with elicit refusal and inappropriate behaviour.
2. If the rider was hesitant, anxious, stubborn, but willing when encouraged and needed steady and consistent support and reinforcement.
3. If the rider was willing when encouraged, compliant, tried when asked, and co-operative.

d) Posture Score:

1. If the rider displayed bad upper and lower extremity control.
2. If the rider displayed either bad upper extremity control or bad lower extremity control.
3. If the rider displayed relatively good upper and lower extremity control.

e) Balance Score:

1. If the rider displayed poor balance when mounted, needed assistance, and could not assume the correct sitting position on the horse.
2. If the rider needed no assistance and rider could assume the correct sitting position at times, but not for more than a few minutes.
3. If the rider displayed the correct sitting position at all times.

1.2 PARENTS' QUESTIONNAIRE

This questionnaire consists of sixteen questions that describe possible changes that you might or might not have observed in your child since he or she started horse riding. Please read every statement carefully and circle either the "yes" or the "no" in the answer box.

(1)	Did the child's balance improved since he/she started horse riding?	YES	NO
(2)	Is the child more supple since he/she started riding. (Example: Can the child stretch further and sit crossed legged more easily than before?)	YES	NO
(3)	Does the child have greater muscle strength than before?	YES	NO
(4)	Has the child's posture improved? (Example: Is the child sitting or standing up straighter?)	YES	NO
(5)	Is there a general improvement in the child's control of the head, arms or legs?	YES	NO
(6)	Is the child finding it easier to walk?	YES	NO
(7)	Does the child suffer pain in the arms, legs or body after a riding session?	YES	NO
(8)	Does the child find daily activities of living easier. (Example: The child puts his/her socks on by him or herself now, or the child can get dressed standing instead of sitting.)	YES	NO
(9)	Does the child find it easier to move with walking apparatus? (Example: The child is positioned straighter and can move faster with the apparatus.)	YES	NO
(10)	Does the child look forward to the riding lessons?	YES	NO
(11)	Does the child enjoy horse riding?	YES	NO
(12)	Is the child less anxious or afraid since he/she started horse riding. (Example: The child is not as scared of heights as before.)	YES	NO
(13)	Is the child more motivated to get involved with new activities than before?	YES	NO
(14)	Has the child's self-esteem improved since he/she started horse riding? (Example: The child is more self-assured and more positive about him/herself.)	YES	NO

(15) Has the child's relationship with friends, brothers or sisters has improved? YES NO

(16) Has the child become more aggressive since he/she started horse riding. (Example: The child fights with brothers, sisters or friends and has become disobedient.) YES NO

Please state any other changes that you have noticed since your child started horse riding:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

ADDENDUM 2

Wes-Kaap Onderwysdepartemen
Western Cape Education Departmen
iSebe leMfundo leNtshona Kolon

vrae: Dr. J.B. Mobbs
quiries
buzo

Verwysing: L: 15/73/7
Reference
Ubhekiso

Telefoon: 403-6093
Telephone
iMfonomfono

Kantoor van die Hoof: Onderwys
Office of the Head: Education
I-Offisi ye

Privaatsak: 9114
Private Bag

Dorp/Stad: CAPE TOWN
Town/City
iDolophi/iSixeko

Poskode/Postal Code: 8000
iKhodi lePosi

Faks: 419-5967
Fax

Datum/Date: 24 January 1997
Umhla

Miss A.M. Stuart
44 Cyprus Road
SOMERSET WEST
7130

Dear Miss Stuart

RESEARCH PROJECT: THE PSYCHOLOGICAL EFFECTS OF HORSE RIDING ON DISABLED CHILDREN

Your application to conduct research at is approved subject to the following conditions:

1. The principals/teachers/pupils are under no obligation to assist you in your investigation.

2. The principals/pupils/schools should not in any way be able to be identified from the results of the investigation.

3. All arrangements concerning your investigation should be done personally.

4. The investigation should not be conducted during the fourth school term.

5. The conditions, as stated in 1 - 4 above, should be submitted unamended to the school principal where the intended research is to be conducted.

6. A brief summary of the content, findings and recommendations should be provided to the Director: Curriculum Management (Research Section).

7. In addition to the brief summary as mentioned in par 6, the Department requires that a copy of the completed report/ dissertation/thesis be sent to:

2./....

The Director: Curriculum Management
Research Section
Western Cape Education Department
Private Bag 9114
CAPE TOWN
8000

Success in your research.

Kind regards

HEAD: EDUCATION

ADDENDUM 3

3.1 TABLE OF PRE- AND POST TEST RESULTS

SUBJECT	AGE	DISABILITY	GENDER	PA	PB	A1	B1	A2	B2	A3	B3	A4	B4	A5	B5	A6	B6	NA	NB	RA	RB
E2	10	Diplegic	Male	68	70	14	15	14	13	13	10	13	14	8	11	10	10	13	11	8	11
E3	9	Hemiplegic	Male	40	56	8	11	12	14	6	8	6	9	7	9	3	6	12	8	7	9
E4	11	Hemiplegic	Female	61	45	10	10	13	9	7	8	8	5	9	5	7	7	12	14	8	10
E5	13	Hemiplegic	Female	64	66	13	14	15	14	10	9	12	13	11	10	10	9	13	16	6	10
E6	10	Diplegic	Female	46	44	12	11	11	10	7	9	5	5	3	4	6	8	14	15	7	12
E7	7	Diplegic	Female	58	46	13	5	12	11	10	12	7	6	11	7	7	7	13	12	6	10
E8	9	Hemiplegic	Male	53	51	12	6	7	11	11	11	11	9	7	11	10	7	11	13	6	13
E9	13	Degenerative Ataxi	Female	60	56	16	14	11	8	8	8	10	10	7	6	9	10	15	13	6	10
E10	9	Hemiplegic	Female	66	64	15	14	12	14	8	8	13	12	11	9	10	9	15	15	8	14
E11	9	Diplegic	Female	57	58	15	14	12	15	11	11	7	4	7	4	8	8	14	14	8	11
E12	14	Triplegic	Male	57	70	12	14	15	16	8	11	11	11	9	10	7	9	15	12	9	13
E13	10	Athetoid	Female	40	45	9	8	9	9	7	9	2	5	5	4	6	8	11	12	7	12
C2	11	Diplegic	Male	58	56	12	12	12	12	7	5	8	12	10	10	6	7	12	9		
C3	9	Hemiplegic	Male	51	50	13	13	13	9	9	7	11	12	10	7	5	7	10	11		
C4	11	Hemiplegic	Female	51	61	11	13	11	13	12	11	6	6	7	10	9	9	16	18		
C5	13	Hemiplegic	Female	60	66	12	13	12	15	8	11	7	13	9	8	8	9	9	9		
C6	10	Diplegic	Female	64	61	15	14	14	15	9	10	10	5	7	9	9	8	16	8		
C7	7	Diplegic	Female	49	54	9	13	14	9	9	8	5	8	6	9	6	8	12	14		
C8	9	Hemiplegic	Male	54	58	10	14	14	14	11	10	8	9	6	9	9	7	12	14		
C9	16	Degenerative Ataxi	Female	54	57	13	15	13	13	9	9	2	5	7	9	7	9	8	8		
C10	9	Hemiplegic	Female	56	53	15	11	14	15	12	10	9	4	7	7	8	5	12	11		
C11	9	Diplegic	Female	68	69	15	13	14	17	11	10	10	12	11	11	9	10	13	15		
C12	14	Athetoid	Male	69	68	16	15	11	16	13	12	13	12	11	11	10	10	11	6		
C13	10	Triplegic	Female	57	64	15	15	14	15	11	8	5	9	9	10	9	6	11	13		

3.2 CODES REFERRING TO TABLE 3.1 ABOVE

PA - Pre-test Self-Concept Total Score (Piers-Harris Self-Concept Scale)

PB - Post-test Self-Concept Total Score (Piers-Harris Self-Concept Scale)

A1 - Pre-test Self-Concept Subscale 1 Score (Behaviour)

B1 - Post-test Self-Concept Subscale 1 Score (Behaviour)

A2 - Pre-test Self-Concept Subscale 2 Score (Intelectual & School Status)

B2 - Post-test Self-Concept Subscale 2 Score (Intelectual & School Status)

A3 - Pre-test Self-Concept Subscale 3 Score (Physical Appearance & Attributes)

B3 - Post-test Self-Concept Subscale 3 Score (Physical Appearance & Attributes)

A4 - Pre-test Self-Concept Subscale 4 Score (Anxiety)

B4 - Post-test Self-Concept Subscale 4 Score (Anxiety)

A5 - Pre-test Self-Concept Subscale 5 Score (Popularity)

B5 - Post-test Self-Concept Subscale 5 Score (Popularity)

A6 - Pre-test Self-Concept Subscale 6 Score (Happiness & Satisfaction)

B6 - Post-test Self-Concept Subscale 6 Score (Happiness & Satisfaction)

NA - Pre-test Locus of Control Score (Nowicki-Strickland Scale)

NB - Post-test Locus of Control Score (Nowicki-Strickland Scale)

RA - Pre-test Rider Classification scale

RB - Post-test Rider Classification scale

RP - Riding Progress (RB-RA)